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OWI Photo by Palmer

ALLOY AMMUNITION DUMP FOR THE WAR MATÉRIEL BUILDERS

COILS of strip and stacks of sheet bars—Allegheny Ludlum Stainless and Electrical steels—how well the United Nations will make use of these vital alloys—and how well Hitler and the Axis would like to have similar stockpiles in as great amount as the United States enjoys.

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required of them—these alloy steels will take their places in the planes, tanks, guns and ships of the fighting fronts. And always, it is a most essential and important place.

High-alloy steels are not ordinary materials. They are not produced, nor can they be used, in ordinary fashion. Above all, they must not be wasted through faulty selection, undue scrap losses, too high a percentage of rejects and spoilage, or any other reason that would prevent a fabricator from getting the maximum amount of war matériel from every ton of alloy steels he uses.

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nical and fabricating data is available on all Allegheny Ludlum grades, and if you need it, the personal assistance of our Technical Staff as well.



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STEEL CORPORATION

PITTSBURGH, PENNSYLVANIA

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THE IRON AGE

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DECEMBER 24, 1942

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In the Scrap for Keeps

THE business papers of America, representing every line of specialized industrial activity have enlisted for the duration. They have organized to support the national drive for the recovery of dormant industrial scrap in the same manner that the newspapers of America organized to support the house to house canvass for domestic scrap.

Unlike the house to house campaign, which had of necessity to be dramatized as a "now or never" operation, the collection of dormant industrial scrap must be a week by week, month by month effort which will last for the duration. For as long as the war lasts, we will have to look to our industries to supplement from their non-used store of equipment, the deficit of scrap iron and steel needed to keep our steel mills running at maximum capacity.

One thing should be made plain at the start. The accumulations of domestic scrap which are now in evidence in some of our towns and cities must not be taken as a reason for the lack of need of industrial scrap.

This domestic scrap serves a most useful purpose. But its best use is with an admixture of the higher grade heavy melting scrap of which most industrial equipment is composed. Steel mill efficiency is increased by mixing the two kinds together, and steel mill efficiency is what we are after to win this war.

This business paper campaign, sponsored by the industrial and business press of America, will reach down into every potential source of industrial scrap in this country. It will endeavor, through both editorial and advertising pages, to impress upon each reader the vital necessity of doing his part in providing 50 percent of the steel needed to beat the Axis.

That's what it means—50 percent. For every battleship, tank, shell and gun made in this country is one-half scrap.

Scrap is a poor word for this precious material. For what we call scrap, in the steel industry, is actually better, in many instances than is the virgin material. It is purer iron to start with.

This campaign by the business and industrial papers of America, both editorial and advertising will be a contribution to the cause of victory by our publishers. The only rewards that we hope from it will be the satisfaction of doing a needed job and the anticipation of its help toward victory. But both of these rewards are beyond price.

The steel-producing industry, the metal working and fabricating industry have already done a magnificent job in this connection. It is our hope that we may stimulate and help you do an even better one. No industry indeed needs to have success achieved along this line more than our own.

J. W. Van Dusen



SUPPOSE **He Took "Time-off" . .**

The doughboy stays at his post come hell or high water. He knows his duty and he does it.

To shirk that duty would mean defeat, even death—and disaster for all of us.

But he cannot carry on the fight alone. He must have guns, ammunition, supplies.

That is our job!

Unnecessary "time off" means lost ships, guns and shells—lost just as surely as if they were destroyed by our enemies in battle.

Stand by our fighters—stay on the job until the fight is won!

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Manufacture of Aircraft Gears

By P. W. BROWN and E. V. FARRAR

Wright Aeronautical Corp.

ONE of the important points which must be considered in the design of gearing for aircraft engines is the fact that, because the gears are light in weight and the supporting structure is light and flexible, the effect of elastic deflections under running loads must be corrected. When multiple pinion planetary systems are used, as in Fig. 1, some method of equalizing the loading on the pinions must be employed. It is necessary to hold the pinion bearing stud spacing to ± 0.0005 in. and the normal pitch of the gears to ± 0.0002 in. The rims behind the teeth of all the gears must be flexible to assist further with the equalizing action but carefully proportioned to provide uniform bearing along the length of the teeth.

Fig. 2 shows the type of finish required for successful operation of one of the small pinion gears shown in Fig. 1. The root radius is completely ground with a surface roughness of about 30 micro-in. r.m.s. Finish on the tooth flank is about 15 micro-in. r.m.s. Note that the sharp edges at the ends of the gear teeth are broken. This is important in order to prevent fatigue failure from possible nicks in the sharp edges. The break-edge operation and subsequent polishing must be carefully and correctly performed in order to accomplish its object.

A section through a correctly hardened and ground pinion is shown in Fig. 3. Note the heavy uniform case which runs from 0.030 to 0.035 in. with a minimum surface hardness of Rockwell "C" 60 and the full radius at the roots of the teeth. A cross-section through an incorrectly ground pin-

... Aircraft engine gears are of fragile and light construction, but are highly loaded. Balance of load distribution is partly assured by designed-in flexibility. Some of the problems of heat treatment and machining of these gears to within extremely close tolerances are discussed in this article, which is abstracted from a paper recently presented before the American Gear Manufacturers Association.

ion of the type used in the planetary reduction gear is shown in Fig. 4 and demonstrates possible manufacturing difficulties. The radius at the root of the teeth has been ground so deeply as to remove the hardened surface and is not properly blended with the flank of one of the teeth. Removal of the hardened case in this manner invites failure because of the lowered endurance limit of the material at the surface of the radius, which is a very highly stressed region. Improper blending of the radius and flank invites failure because of surface discontinuity.

Tooth Modifications Necessary

Design methods have been arrived at over a period of time which permit us to build a gear with reasonable certainty that it can be made to work. Mathematically these methods are not complex because the final answer is obtained by testing. Making a gear set work generally involves modifications of tooth form, supporting structure and gear tooth backing structure

to correct for elastic and temperature deformations encountered in service. These modifications are nearly always completed without increasing the weight and in some cases are accomplished by removing metal and thereby reducing weight. Some teeth, for example, require a slight dropping off of the involute at the tip and others at the flank. Some require both to produce a barrel type form. In some cases it is necessary to modify the pressure angle to produce a full bearing under operating conditions.

It has been well established that involute spur gear teeth of the type commonly used in aircraft engines can be made to work at a wide range of pitch line velocities at a pressure at the center of the tooth contact area of 135,000 lb. per sq. in. calculated on the basis of the Herz formula. (See Appendix.) Some well developed gears are operating in excess of this pressure. The range of diametral pitch numbers commonly used is from 6 to 12. In this range we would hardly attempt to design a gear

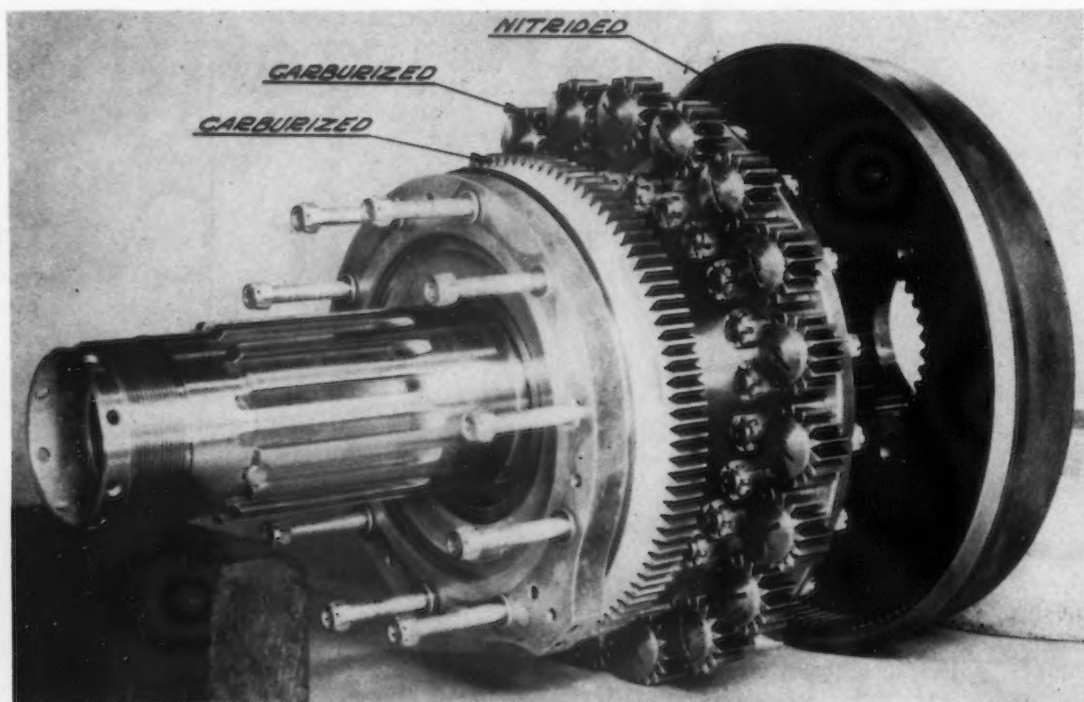


FIG. 1—Complete propeller reduction gear for a radial aircraft engine. It is of the planetary type, consisting of a stationary central gear, 20 small pinions carried on the propeller shaft, and a large internal gear surrounding the pinions. The large internal gear is driven at crankshaft speed and the pinion carrying frame on the propeller shaft at 9/16 of engine speed. The 20 pinions on the propeller shaft have 15 teeth each of 10.4 diametral pitch, 23

deg. pressure angle and have a face width of 0.872 in. The internal or driving gear has 135 teeth and the sun or stationary gear has 105 teeth. At take-off power, each of these pinions carries a load of 80 hp. and each tooth operates under a maximum contact pressure of 120,000 lb. per sq. in. The tangential load on each tooth is 372 lb. The torque transmitted to the propeller by the complete gear is 74,800 in.-lb.

with a face width of more than 1 in. Some years ago, the stub tooth form was in common use because of its great static strength. However, the trend is definitely toward full depth teeth because their greater flexibility appears to be advantageous in the correction of unavoidable deflections under operating conditions and of the slight imperfections which are bound to occur in the machining process. A further advantage of the full depth tooth is that the larger overlap permits more modification of tooth form without destroying the rolling action.

The thickness of the supporting rim behind the teeth of a spur type gear can be made approximately equal to the thickness of the teeth at the roots. Modification of the form and thickness of the supporting rim may be necessary in order to produce proper tooth bearing. These modifications can be determined only after testing. The pinions used in the planetary reduction gear shown in Fig. 1 were initially developed by means of photoelastic

and brittle paint tests. Comparatively slight modifications were necessary after engine testing.

Spur Gears Favored

With very few exceptions, all aircraft engine gears are of the spur type. Helical gears have not found much favor in aircraft engines. Should the ultimate in quiet running gears ever be demanded, provisions will have to be made to absorb end thrust, which is the present objectionable feature. Herringbone gears would introduce many assembly problems and be difficult to handle because of dimensional changes in the support caused by temperature and deflection. Spiral gears have not been used in aircraft engines because they do not stand up under the high rubbing speeds with the lubricants available. In aircraft engines, noise is not of great importance because exhaust and propeller noises far exceed gear noises in intensity, and emphasis is placed on performance and reliability with a minimum of weight. However,

because of the high speed at which aircraft gears generally operate, the elements of accuracy such as involute form, normal pitch, and concentricity must be closely maintained.

Distortion during heat treatment has been the greatest manufacturing problem facing the makers of aircraft engine gears. Aircraft weight restrictions and compact design requirements result in gear blanks of such section and form that the least variation in size, steel, furnace temperature or steps in processing produce warpage. Many experiments with heat-treating methods and equipment did not completely eliminate distortion and it was necessary to find means of correcting gear teeth after hardening. The most practical process available is grinding. Approximately 80 per cent of all aircraft engine gears are finish ground.

Grinding Corrects Distortion

The Wright Aeronautical Corp. was among the first to use gear grinding as a high production

method and has followed this procedure closely since its inception.

Both generating and formed wheel type grinders are used. It is believed that the overall cost compares favorably with that of unground gears when all operations required to produce similar gears by other methods are considered. It is important that all operations prior to finish grinding be sufficiently accurate that substantially uniform stock is removed at the final operation. Grinding operations must be performed with care and skill to avoid burning or cracking of the case. This is done by proper coolants, correct wheel speeds, selection of the correct grade of wheels, elimination of side wheel grinding of large areas and control of case carbon content and hardness.

Tooth form modifications are easily made with certain types of grinders.

Finish is an important consideration in connection with highly loaded gears. All tooth surfaces must be free from cutter or wheel marks and blend with adjoining surfaces without sharp edges. A particular advantage of gear grinding is the possibility of refining the tooth finish at the root fillet where the bending stresses are greatest. This is especially true on pinions where the cutters or hobs produce generating ridges which

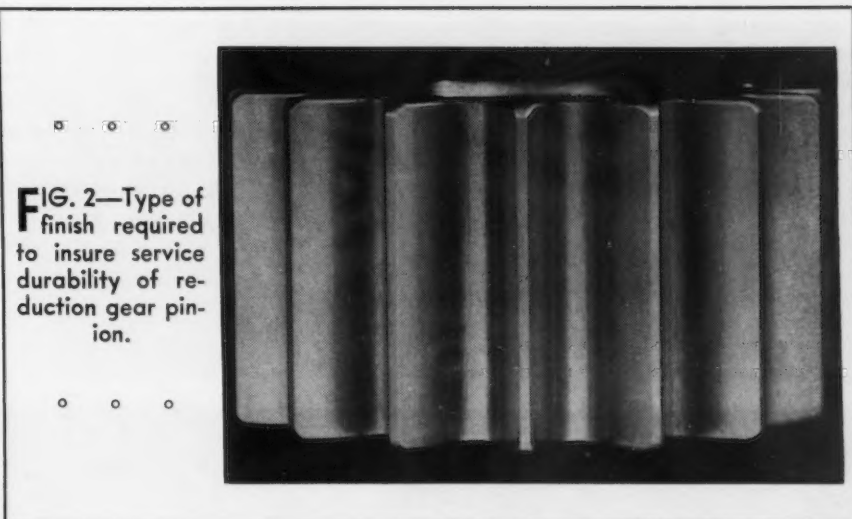


FIG. 2—Type of finish required to insure service durability of reduction gear pinion.

are the source of possible tooth failure.

An important operation in connection with the finishing of many aircraft engine gears is that of breaking the edges at the ends of the teeth, as mentioned in connection with Fig. 2. The edges must be broken and blended along the entire tooth profile as well as at the root fillet. This involves considerable bench work and for the pinion of Fig. 2 the standard time for cutting and grinding teeth is 9.2 min. and that for burring and breaking edges is 5.8 min. This indicates that 36 per cent of the time required to produce the gear teeth is consumed by the hand op-

eration of breaking the edges. The break-edge operation is usually done with a pencil wheel or a thin disk on a special high speed motor head. For final finish and blending, the edge is brushed with a Tampico wheel on a polishing jack. A cup type holder is used to prevent any surface but the edge from being brushed.

There are some gears which cannot be ground because of their design and which require a double set-up for roughing and finishing. The surfaces of important gears of this nature are finished by lapping. Ground gears are lapped slightly to remove the "fuzz" produced by the grinding wheel. Both helical

FIG. 3—Section through a correctly hardened and ground reduction gear pinion.

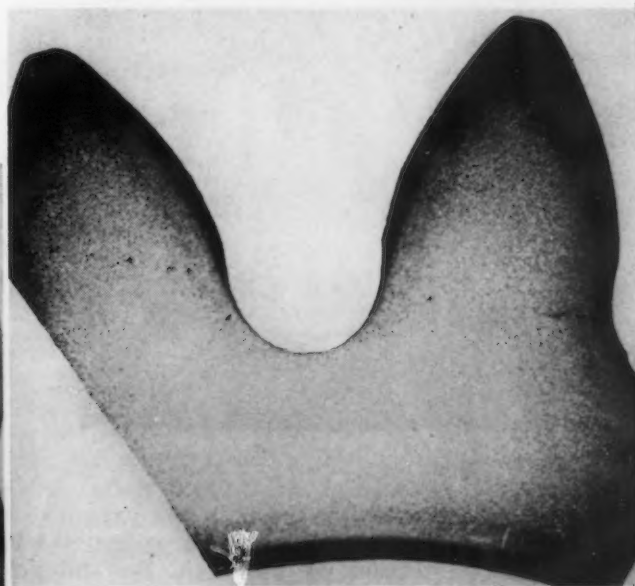
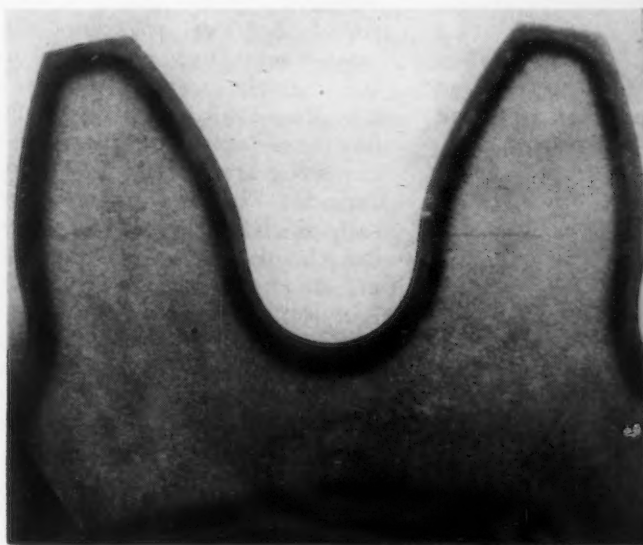


FIG. 4—Section through improperly ground pinion. Case hardened material has been removed at the root.

and internal type lapping machines are used.

100 Per Cent Inspection

In order to minimize the possibility of any defective gears getting into service, most aircraft engine gears are inspected 100 per cent. One of the most important parts of this inspection is the Magnaflux check. The aircraft industry was one of the first to use

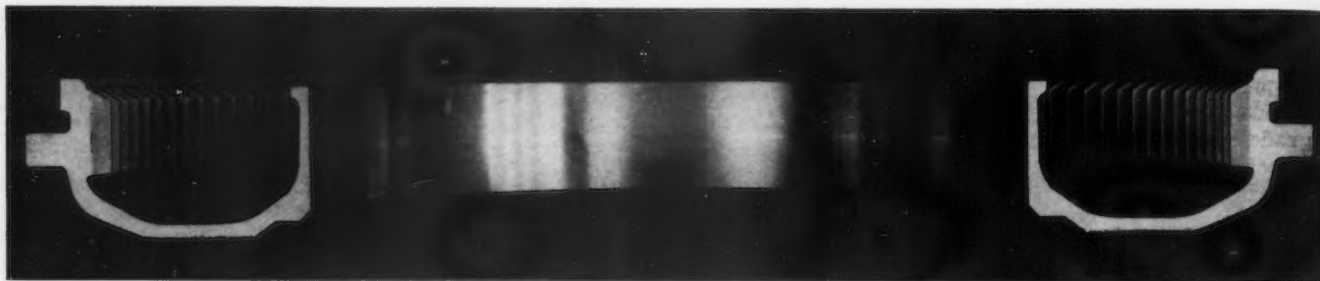
adoption of Magnaflux inspection.

As a check on equipment and machine set-ups, the involute form and normal pitch of gear teeth are checked at the final finishing operation. In many instances permanent records are kept to determine the effect of shop variations after definite running periods. At final inspection, gear teeth are checked for size, surface finish, and for roll on both adjustable and non-adjust-

fore final assembly; test and shipment.

Nitrided Gears

Nitralloy steel has several advantages for production of many aircraft engine gears. Today, about 20 per cent of the gears in the engine are of this material. One of the important advantages of nitralloy is that its use makes possible surface hardening of the teeth



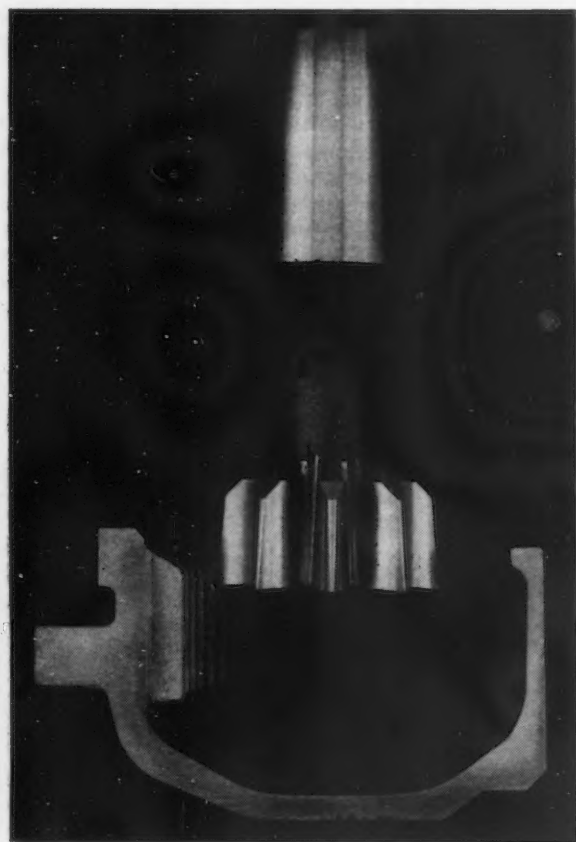
ABOVE

FIG. 5—Section through plate type cam with driving gear and hub. The light sections make this a very difficult part to heat treat.

o o o

LEFT

FIG. 6—Section through cam and gear showing small shaper cutter required because of restricted clearances.



of large gears of light section which would be utterly impractical to carburize and quench. The surface hardness does not drop after brief service as frequently happens with a carburized case. Our planetary gear systems are generally constructed with a carburized pinion running between a nitralloy stationary gear and a nitralloy driving gear because the "sun" gear and surrounding gear are usually large and of thin or complicated section. There are some exceptions to this practice where it is possible or advisable for other reasons to carburize two members of the gear grain as in Fig. 1.

All gears are made from forgings with carefully controlled flow lines in order to secure maximum strength. It has been well established that steel parts are somewhat weaker under repeated loading and impact across the forging flow lines than in the direction of flow lines so that gears made of bar stock are not apt to be satisfactory. Forgings are normalized and annealed before machining. Gear blanks are usually finished to grinding size before carburizing. Because of the generally fragile and irregular sections of aircraft engine gears, the major portion are quenched in dies.

A very difficult part to heat treat and finish is the cam shown in section in Fig. 5. Center bearing, cam track and gear must be concentric and parallel. The relation of cam lobes and gear teeth must be main-

Magnaflux inspection of gear teeth. Minute flaws in the material and grinding checks revealed by this method resulted in a number of rejections when it was first adopted but has led to the improvement of materials and processes so that we have today gears much superior to those produced prior to the general

able type fixtures.

A final check on the gears and, in fact, all aircraft engine parts is the so-called "green run," which involves approximately 3 hr. of running of the completed engine from low load to full speed and power. After this run, all parts are inspected for possible flaws be-

tained because of engine timing requirements. Note the uneven distribution of metal in the web and rim parts and the cuplike shape which makes uniform quenching a problem. The restricted cutter size necessary for forming the teeth is shown in Fig. 6.

Another example of a gear quite difficult to heat treat and finish satisfactorily is that shown in Fig. 7. With this part the problem is to maintain the required concentricity between the internal splines and the gear teeth.

Compare this gear with Fig. 8, which shows a section through an automotive type transmission gear. Note its bulk and solid construction. The mean value of the maximum contact pressure between the teeth of the gear set of which this gear is a part is probably considerably lower during service operation than the pressure in most aircraft gears. The maximum pressure may be higher but will exist for short periods only. Weight of the gear is not important. It must not be a noise generator. The mean bending stress in the teeth during service operation is probably considerably lower than the similar figure for aircraft gears so that a full radius at the tooth root is of no particular advantage. The improvement effected by this radius does not become great unless many cycles of high stress are applied to a given tooth in service. For the same reason, finish at the roots between the teeth is not particularly important.

Many truck and bus gears are of carburized and hardened SAE-3312 with ground spur teeth. Some passenger car gears are made of SAE-3312 and carburized but the major portion are deep hardened without carburizing. Elimination of the carburizing treatment in conjunction with heavier sections, results in considerably less distortion. Core hardness is higher than for aircraft gears.

The majority of automotive gears are finished by shaving and the procedure is to shape or hob the teeth with an undercut or protuberance type tool allowing approximately 0.003 to 0.004 in. on tooth thickness for shaving. The shaving tool finishes the working surface of the tooth, the root and fillet remaining as produced by the shaper cutter or hob. Most transmission gears are either on solid shafts or are of the bulky proportions shown so that they can be solidly mounted during the machin-

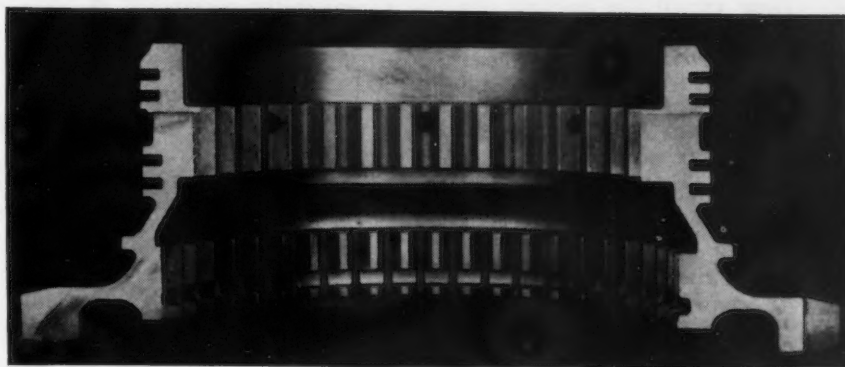


FIG. 7—Section through gear with splines. Such a gear is most difficult to heat treat and finish satisfactorily.

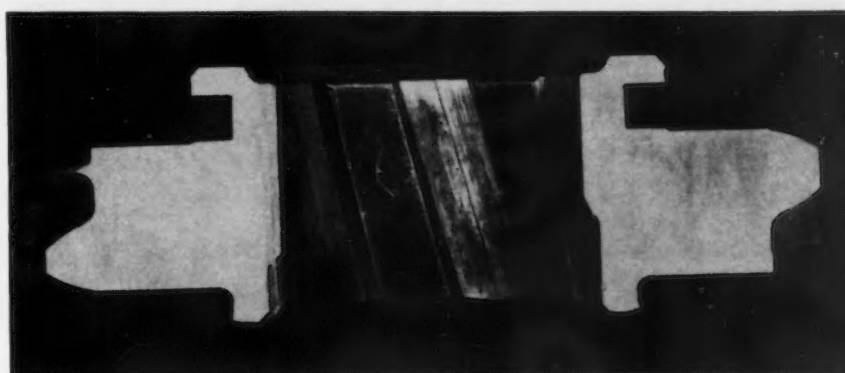


FIG. 8—The heavy sections of an automotive transmission gear present no problem from the point of view of distortion in heat treating.

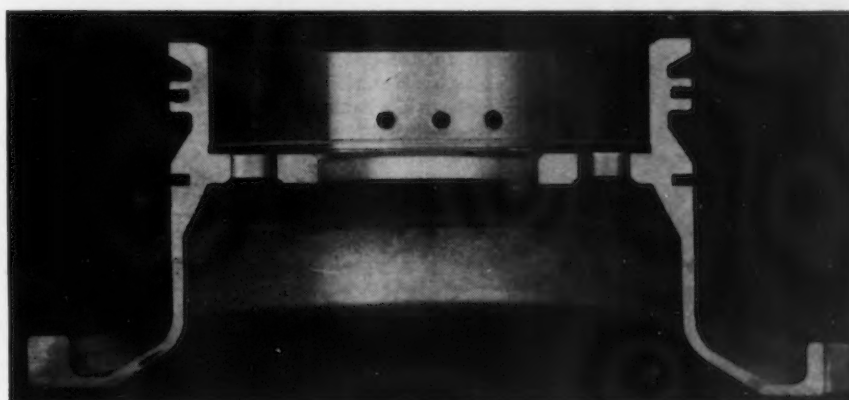


Fig. 9—Section through aircraft engine gear that might be shaved.

ing operation. This rigidity tends to eliminate considerable error which might occur in going from one operation to another.

We are frequently asked why aircraft engine gear teeth are not shaved. We believe that gear grinding has many advantages in connection with the type of gearing we must produce. Furthermore, before shaved gears can be widely used in aircraft engines, many details of manufacturing procedure will have to be worked out and the

resulting gears proved by engine test. Some of the points which need clarification are:

- 1—If gears which cannot be ground are shaved, will the undercut necessary to clear the tip of the shaving tool cause a reduction of load carrying ability?
- 2—Can distortion at heat treat be kept small enough to permit shaving and can hardening subsequent to shaving be done without further distortion?
- 3—Will the cost of controlling and inspecting preparatory opera-

tions exceed the possible time saved by shaving?

- 4—Will existing furnace equipment and heat-treating methods produce surfaces free from decarburization in view of the hardness required to withstand the loads?

The demand for gear grinders in the present war emergency necessitated by the production expansion program has made it necessary to seriously consider shaving of all aircraft gears where there is

a reasonable possibility of success. This is being done in conjunction with various cooperative vendors and we have no doubt that many new and useful methods will spring from this work.

An example of a gear which could probably be shaved is shown in Fig. 9. This gear is similar to that of Fig. 7 with the important exception that there is no requirement for close concentricity be-

tween the teeth and internal splines. Since these gears serve similar purposes, one obvious answer to the problem of shaving aircraft gears would be redesign of parts to facilitate the process. This would be a tremendous job under any circumstance and impossible at the moment. It will, no doubt, proceed over a period of time as has the process of redesign to facilitate manufacture in the automotive industry.

APPENDIX

The basic Herz formula was developed to determine the maximum contact pressure between a pair of elastic rolling cylinders. One of the things which can be gotten from the formula is the maximum contact pressure between the two cylinders at the center of the contact area. This equation can be modified to be applicable to the curved surfaces of a pair of gear teeth in contact as given below.

$$P_{max} = .591 \sqrt{\frac{P' \times E}{\sin \alpha} \times \frac{PD_1 + PD_2}{PD_1 \times PD_2}}$$

Where P' = Tangential load per inch of tooth face

E = Modulus of elasticity of material

α = Pressure angle

PD_1 = Pitch diameter of gear (external type)

PD_2 = Pitch diameter of pinion

P_{max} = Maximum pressure at center of contact area

The equation given is the conventional one for compressive stress between the mating teeth of two gears in contact at the pitch line. The equation admittedly does not account for any stresses which may be generated in the gear teeth because of the relative sliding action. Experience has indicated that a maximum pressure value of 125,000 lb. per sq. in. can safely be used for the initial design if the supports for the gear system are properly constructed, teeth suitably modified to account for deflections and the gear is to have a high strength core and case hardened teeth. Using the above formula and the maximum pressure value given, it will be found that a 23 deg. pressure angle 1½ in. pitch diameter pinion meshing with a 6 in. pitch diameter gear with teeth of conven-

tional form can be made to carry a tangential load of 700 lb. per inch of length if there is sufficient bending strength in the teeth.

We find the Lewis formula satisfactory for calculation of the bending strength of gear teeth. One form of this formula is:

P_s = Safe load in pounds per inch of face

DP = Diametral pitch

Y = Strength factor

S = Strength of core material.

$$P_s = \frac{S \pi Y}{DP}$$

As is well known, the Lewis formula was developed on the basis of a beam of uniform strength which has the same bending strength as the tooth at its weakest section, which is the root. The load was assumed to act normal to the working surface of the tooth at the tip.

For small pitch diameter pinions bearing against large gears, we find that the formula gives a very good indication of the static strength of the tooth when S is the ultimate strength of the material. For repeated loading, which is the normal case with gear teeth, we modify the strength factor Y to account for the reduction of stress concentration at the root of the tooth accomplished by use of the full radius and substitute for S the endurance limit of the material. Use of the full radius increases the bending strength of a tooth to approximately 2½ times that of a tooth with conventional root form.

The critical stress in most aviation engine gears is tooth contact pressure and not bending stress. No velocity correction factors have been found necessary at any pitch line speeds we have employed to date. This is probably true because gear rim sections are made flexible and tooth spacing is accurately held.

Belt Life Shortened by High Tension

CONCLUSIVE evidence that the life of rubber transmission belting and V-belts is greatly influenced by the tension factor, and that an increase in the tension over that recommended for the belt operation will result in failure of the belt long before it should break down is furnished by data from a series of tests conducted by the B. F. Goodrich Co.

Three grades of the present wartime construction of transmission belting were used in a series of accelerated tests which were run at 15 lb. per in. per ply, a 720 lb. total for the tension, the recommended figure, and at 18 lb. per in. per ply, a total of 864 lb. tension, on 4-in. pulleys. Belts were all 6 in. wide,

30 ft. in length, spliced in 10 ft. endless lengths.

Belt No. 1 ran for 95 hr. before breakdown while under the 18 lb. tension, and increased its life to 230 hr. before failure when the 15 lb. tension was used. Belt No. 2 ran for 88 hr. at the 18 lb. tension, and for 263 hr. before failure at 15 lb. Belt No. 3 ran for 15 hr. under 18 lb. tension, and the service life before failure jumped to 48 hr. under the 15 lb. tension.

Conclusions reached are that an increase of 3 lb. per in. per ply over the recommended tension results in the belt giving only approximately one-third of its useful service life.

Similar conclusions were drawn from tests conducted on one style of

V-belts used on a domestic washing machine. The accelerated test consisted of a dead load suspension with the driver sheave 2⅝ in. outside diameter and the driven sheave of 5¼ in. outside. First three belts under tension of 125 lb. averaged 4½ hr. of life before failure. Second three, under 95 lb. tension averaged 27.4 hr., while the last three, under 80 lb., averaged 86 hr.

In giving these test results, the B. F. Goodrich Co. points out that because of their short, highly accelerated nature, they are not an index to life in actual service, and were made only to get data on the ratio of tension to belt life. To have any direct evaluation to real service, tests should be made for much longer periods, the report concludes.

European Adaptations of Wide Strip Mills

• • •

THE adaptation of the continuous wide-strip mill developed in America to European conditions has been closely studied in Europe and, according to the English *Iron and Coal Trades Review*, was the subject of a report by the Rolling Mill Committee of the Verein Deutscher Eisenhüttenleute, reprinted in *Stahl und Eisen* March 26. The report's introductory remarks point out that in nearly all strip rolling processes a wide strip is first hot rolled from a slab, and this product is then cold rolled into a continuous wide sheet. To differentiate between these two operations, the hot-rolled product is designated in the report as a wide strip, and the mill producing it a hot or wide strip mill, and the finished cold rolled product is called a continuous wide sheet, and its mill a cold or wide sheet mill. These terms are used throughout the report in these connotations.

Considerations which must be taken into account, the article says, in designing a wide strip mill to operate in local conditions, include the tonnage and size of the finished product; the balance between hot and cold rolling operations; initial cost; marginal products, which include ranges just outside the original objective; the suitability of the roughing or finishing trains for individual jobs; roll diameter and barrel sizes; minimum and maximum widths which can be economically rolled; general layout and composition, including number of stands, intermediate heating arrangements, coil weights, and

... Continuous rolling of wide strip is essentially an American development, and is not feasible in individual countries of Europe because of insufficient demand. A German report on devices for modifying continuous mills to suit European conditions is reviewed herein.

stitching or welding prior to pickling.

Before proceeding to a discussion of the mill proper, the author fully considers the effect of slab weights and the determination of final gage and tolerances.

The report then describes the characteristics of various prototype designs of mill and compares their capacities and practical efficiencies.

The standard mill with which the various strip mill layouts are compared is here the continuous wide-strip mill, the first prototype of this type of mill. The general layout of this mill is shown in Fig. 1. Its very high capacity is, of course, offset by the high first cost of the mill, and although a simpler layout may be adopted, the cost does not drop in direct proportion to the reduction in capacity.

In addition to the general diagrammatic layout of the mill, Fig. 1 also includes a diagram of the rolling schedule, a time diagram for fixing the slab sequence and hence the performance per unit time, and a diagram showing the variations in energy consumption. The shortest slab sequence in the roughing train is indicated by the distance A, and the shortest strip sequence in the finishing train by the distance B. This determines the maxi-

mum capacity of the mill, which according to the final strip gage and the delivery speed, may amount to 90 to 135 tons per hr. per 36 in. of strip width. This output per hour is much lower than that which can be calculated from Fig. 1.

Energy Consumption

When the mill is run to capacity and there is a uniform strip sequence, the peak energy consumption values are not much higher than the average consumption F, as indicated by the values C and D. Similar conditions rule when rolling a single strip, for which average energy consumption is indicated by E. The finishing stands are driven by d.c. motors, and three-phase motors and flywheels may be used on the roughing stands. Intervals in rolling at each stand permit energy to be stored by the flywheels. Nevertheless, conditions at the last stand should be carefully studied in view of the great length the strip has attained at this point. In some cases it may prove practicable to install a more powerful three-phase motor without a flywheel on this stand.

In a semi-continuous mill, a single stand through which the material is reversed serves for roughing. This stand can be either of the

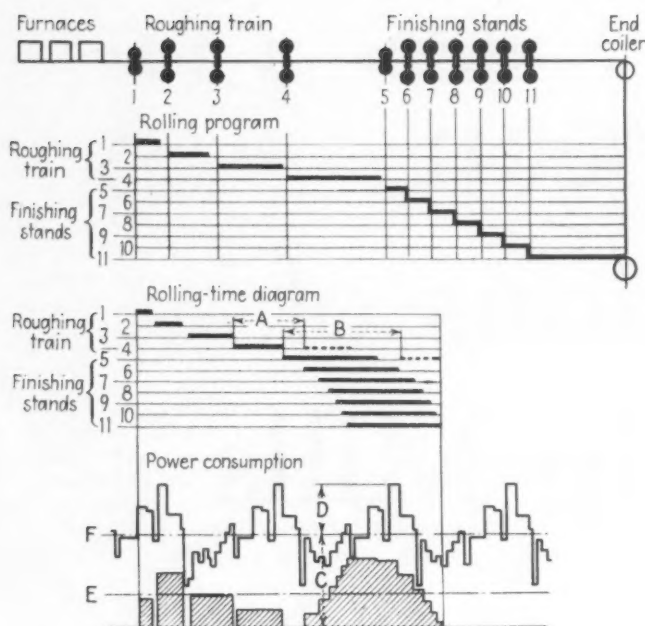


FIG. 1—Diagrammatic layout of a continuous wide strip mill, with rolling time and power consumption diagrams.

two-high or four-high reversing type, or alternatively a three-high stand with "run-through" rolls. In these mills, the rating of the roughing train determines the capacity of the mill. If the same finishing train is used as in the continuous mill—that is, six stands and a scale breaker, as shown in Fig. 1—the output per hour of the whole plant is about 70 per cent of that of the continuous mill. The coil weight, however, drops to about 80 per cent with the same rolling time per strip and same final strip gage. It is true the number of stands is reduced by three, but the cost of the

electrical equipment, if a reversing program is adopted, is high. If the stock enters the mill on the remote side, the number of passes in the roughing train will be odd, against even for the scheme shown in Fig. 1. A direct comparison cannot therefore be made, but the data given are sufficient to show that the substitution of a continuous roughing train by a single reversing stand does not bring any advantage, largely owing to the resulting reduction in capacity.

When selecting single stands, also for the finishing train, it should be remembered that in construction

and drive this stand must be comparable to the stands in the continuous train. If a three-high stand with three-phase drive is chosen, the same three-phase drive that is employed on a stand in the continuous train cannot be installed without alteration, since the rolling intervals in a reversing program are much shorter, and hence less time is allowed for the flywheels to store energy. Quite apart from this, if the number of finishing stands is reduced and the number of passes in the roughing train correspondingly increased, the length of strip at the last pass will determine the horsepower rating. In medium width sheet mills of early design, which may be taken as a basis for comparison, 600 h.p. to 700 h.p. per 36 in. strip width is sufficient with a flywheel energy about four to five times the standard rating at 10 per cent reduction in speed per second. In comparison, the required output of a motor in a strip mill must be about 2000 h.p. to 2500 h.p. per 36 in. strip width, with a correspondingly lower flywheel rating.

Use of Existing Roughing Train

Frequently it is sought to use an existing train for roughing in a wide strip mill. If the capacity of this train is low, it may have a very adverse effect on the capacity of a semi-continuous mill of the type shown in Fig. 2, and great care must be taken in incorporating an existing train in the planned layout of a new strip mill. The installation of a semi-continuous mill is usually considered as a means of reducing production costs, but due regard must also be paid to the reduction in output per hour and the lower coil weights obtained. By reducing the coil weight, a smaller number of stands may be used in the finishing train, while retaining the same final gage of sheet.

In the comparison made below, it is assumed as before that the total rolling time is the same as in the continuous mill; this signifies a shorter slab, and hence shorter coil lengths, in order to make up for the longer rolling stages conditioned by other factors in the mill. A semi-continuous mill with a two-high reversing roughing stand and five finishing stands is shown in Fig. 2. As already stated, the output per hour in a layout of this type is determined by the capacity of the roughing unit (distance A). Yet it should be noted that in semi-continuous mills the roughing train is

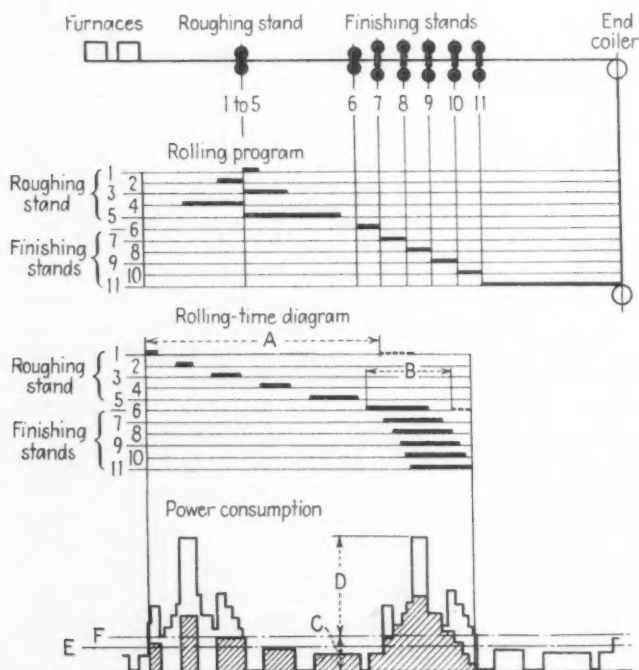


FIG. 2—Semi-continuous strip mill with a two-high reversing roughing stand and five finishing stands

driven at the highest practicable speed, while in the roughing train sufficient time is available for the roughing passes. The coil weight in this semi-continuous mill with five finishing stands is about 60 to 65 per cent that with the continuous mill, and the output about 49 per cent. Energy consumption peaks are about two and three-quarter times the average value, a disadvantage of the semi-continuous type which has an important bearing on main loads; some alleviation can, of course, be obtained by introducing a flywheel.

The rolling time in the roughing train (A) is much longer than in the finishing train (B), and it may seem feasible to reduce the rolling speed in the latter to make the rolling times the same in the two trains, and thus arrive at a uniform load throughout. Reducing the speed of the finishing stands by 25 per cent will reduce the output per hour to about 42 per cent, and the coil weight to around half, since, in spite of a speed reduction, the total rolling time taken here as a basis of comparison with the continuous strip mill cannot be exceeded.

When the strip is reheated in the course of the rolling program, an entirely different state of affairs is obtained. Various methods have been proposed for such intermediate heating, but up to the present only the hot coiler has proved practical. These furnaces serve less for reheating the material being rolled than for maintaining a uniform temperature. The best known of these hot coilers is that used in the Steckel mill. In Germany a plant on these lines has been built, but it cannot be put into service under present conditions.

Steckel Mill

Fig. 4 shows the same plant as in Fig. 3 amplified by hot coilers on each side of the finishing stand, converting the mill to the Steckel type. As heat losses are prevented in the hot coiler, it is sufficient to feed the strip into the coiler at the proper temperature. To do this, the material in its passage from slab to coiler commences with a gage of about 0.5 to 0.6 in., and is rolled down to coiler thickness. The time taken to do this can here be made longer than the total rolling time in the continuous mill. In Fig. 4, the conditions are made as nearly as possible the same as those ruling in the continuous mill, by selecting the same weight and thickness of slab

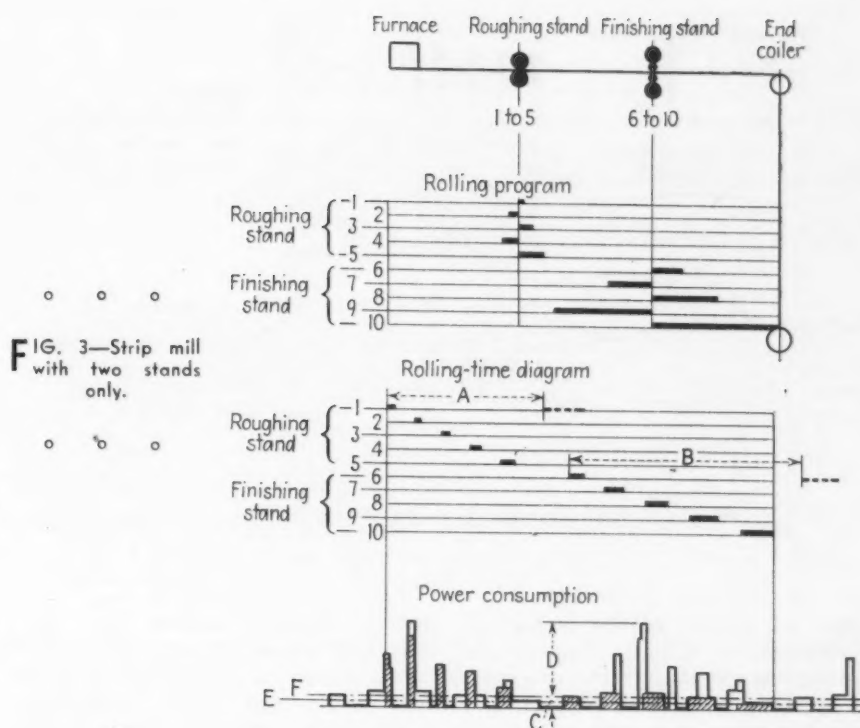


FIG. 3—Strip mill with two stands only.

and the same final gage as in Fig. 1. Fig. 4 also shows that the hourly capacity of the mill is determined by that of the finishing stand. Since the roughing stand is not running to capacity, a thicker slab can obviously be used in the Steckel mill. Even ingot slabs from the point of view of thermal conservation can be rolled down to wide strip. The coil weight can be taken as great as, and even greater than, in the continuous mill. On the other hand, a longer rolling time is required in the Steckel mill, so that the output drops to about 21 per cent.

The thinnest gage strip which can be rolled in the Steckel mill is heavier than the final gage obtainable in the continuous mill, owing to the distance of the hot coilers from the rolls and the lower rolling speed, the maximum of 16½ ft. per sec. being dictated by reversing operations. The heavier final gage

gives a higher output, which in certain circumstances may rise to as much as 25 per cent of that on the continuous mill. Practical experiments alone will determine the final gages obtainable for different widths; these may be roughly estimated at 0.1 in. at 71 in. width and 0.08 in. at 49 in. width. Power consumption is comparable to that in single-stand mills. The advantages of the hot coilers are here offset by the disadvantage that all finishing passes must be carried out with the same pair of rolls. This can, however, be overcome by frequently changing the rolls, which may be done in 6 min. to 7 min. per roll.

Röchling Mill

In the Röchling mill, hot coilers are inserted between the stands in the finishing train. The layout and principle of this method have already been described in these col-

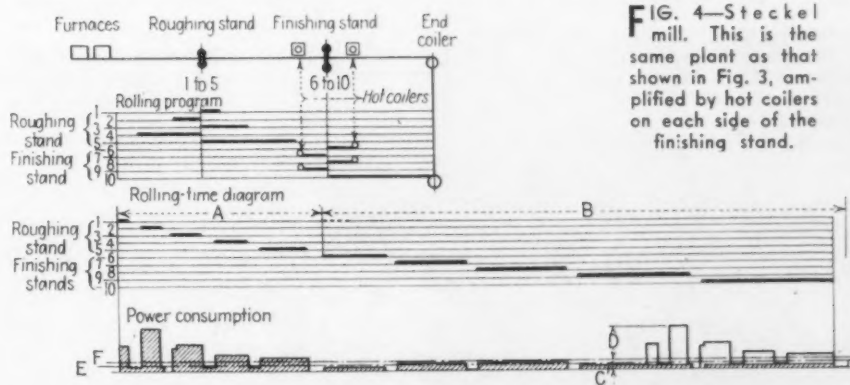


FIG. 4—Steckel mill. This is the same plant as that shown in Fig. 3, amplified by hot coilers on each side of the finishing stand.

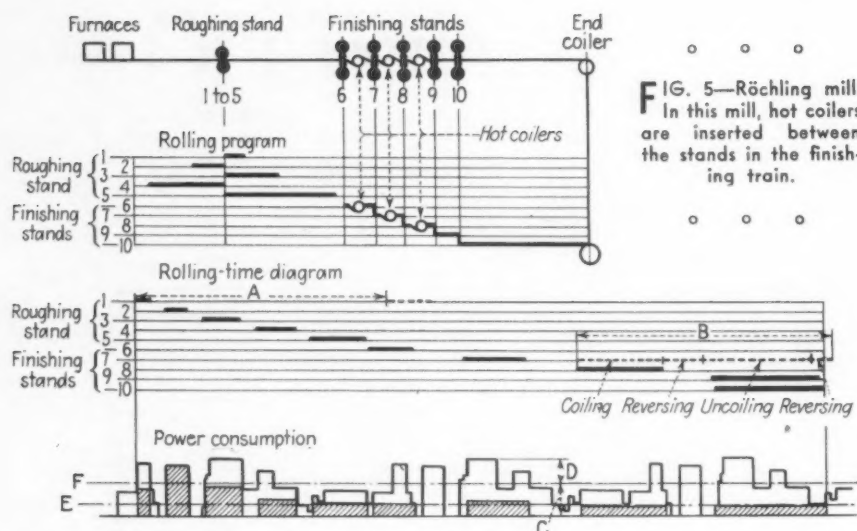


FIG. 5—Röchling mill. In this mill, hot coilers are inserted between the stands in the finishing train.

umns, the general scheme being recapitulated in Fig. 5. The strips leaving the roughing train are rolled by the first pair of rolls in the finishing train and then coiled up in the following hot coiler. After a few additional revolutions, the strip is again uncoiled and passed through the second stand, this process being repeated at the subsequent stands. Again here, as in the Steckel mill, the material must have an adequate temperature at the first hot coiler. Owing to the comparatively high conservation of heat, the number of stands can be reduced, and hence also the cost of the plant. Fig. 5 shows five finishing stands to permit direct comparison with the semi-continuous mill in Fig. 2, where again roughing is done in only one stand.

No scale breaker is provided, and the degree of reduction in the indi-

vidual finishing stands has been correspondingly increased. In this arrangement, a coil weight up to 88 per cent of that in the continuous mill can be obtained, although the output is reduced to about 53 per cent. Contrary to the semi-continuous mill, the capacity here is not determined by that of the roughing train, but by that of the finishing train; nevertheless, the rolling times in the two trains should be made the same as far as possible.

By reducing the number of finishing stands from five to four, the operating data for this mill are modified as follows: The capacity is then about 35 per cent, and the coil weight about 60 per cent of the corresponding figures for the continuous mill. These figures can be still further improved if the last pass at the roughing train is made such that the fore end of the strip

reaches the first finishing stand before the other end leaves the rougher. In comparing this mill with the semi-continuous mill, due weight should be given to the higher coil weight and the reduction in cost.

By introducing hot coilers in the rolling train, various layouts may be obtained; the principal of these are shown in Figs. 4 and 5. A disadvantage of the continuous finishing train is that the beginning of the strip is finished rolling in a few seconds, while the other end does not emerge for some time. Since the material being rolled cools meanwhile, rolling conditions for the rear end are different from those ruling for the fore end, thus causing variations in gage. It seems reasonable, therefore, to run the strip into a hot coiler after it leaves the roughing train, to effect heat equalization and then to pass the strip to the finishing stands in a heat-stabilized condition. In the finishing stands, the whole length of strip is then rolled under uniform conditions, doing away with the disadvantage of thermal inequality. As some strip after leaving the roughing stands cannot be conveniently coiled owing to its thickness, the hot coiler should then be placed after the first or even the second stand in the finishing train.

In Fig. 6 a hot coiler is shown behind the first stand in a five-stand finishing train. The first finishing stand must be run at a high speed commensurate with the rate of delivery from the roughing stand, and the strip then passed to the second finishing stand at a speed lower than in the continuous train, the speed through subsequent stands being also correspondingly reduced, as well as the delivery speed at the end of the train. This naturally reduces the output of the finishing train, the introduction of the hot coiler cutting down the delivery speed and increasing the total rolling time in the finishing train. As in the fully continuous mill, the finishing train determines the capacity of the whole plant, the addition of a hot coiler will reduce this figure, but this reduction cannot be very large, since the overall utilization factor of the continuous mill is itself low. On the other hand, a hot coiler in the semi-continuous layout permits the rolling time in the roughing train to be more closely adapted to that in the finishing train, so that here the overall capacity is not much reduced by the hot coiler (Figs. 2 and 6). If heat

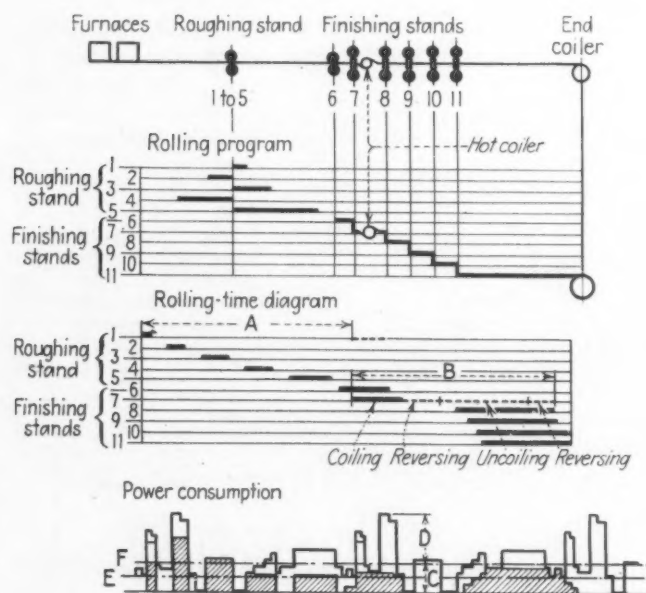


FIG. 6—Semi-continuous mill with a hot coiler behind the first stand, in a five-stand finishing train.

is supplied in the hot coiler, the coil weight can be correspondingly increased and also the same high delivery speed as obtained in a continuous mill can be realized. It is not expensive to add a hot coiler, while it offers the advantage of insuring uniform heat distribution.

In planning a wide-strip mill, consideration must be given to a number of prerequisites and factors which are discussed in some detail. Apart from the width of the strip, the final gage required is of fundamental importance in fixing the dimensions and layout of such a mill. Other important factors are the final coil weight and gage tolerances in the strip. The variety of products which can be rolled on a mill of this kind to permit the fullest utilization of its capacity should also be considered. A comparison of the various rolling schedules is made in Table I, showing the respective coil weights, capacity per hour and first cost of the plant as compared with a continuous mill with six finishing stands taken as a standard. The data given in this

TABLE I
Comparison of Various Systems of Strip Rolling

[No.	Type of Mill	Coil Weight	Capacity Per Hr.	First Cost
		As percentages of No. 1		
1	Continuous mill with three roughers and six finishing stands.....	100	100	100
2	Semi-continuous mill with one rougher and six finishing stands.....	80	70	81
3	Semi-continuous mill with one rougher and five finishing stands.....	60-65	49	74
4	Single stands, one rougher and one finisher.....	15	14	37
5	Steckel mill, one rougher and one finisher.....	100	21	48.5
6	Röchling mill with five finishing stands and a hot coiler after each of the first three finishing stands.....	88	53	71
7	Röchling mill with four finishing stands and hot coilers after each first and second finishers.....	60-65	35	63
8	Semi-continuous mill with five finishing stands and a hot coiler after the first finisher.....	70	9	74

table are naturally only approximate. In selecting a particular layout for a strip mill, the closest

analysis is necessary on the basis of the capacity and width of strip required.

Aircraft Rivets Headed Uniformly

REPLACING human judgment by automatic features in equipment is the most logical solution to the problem of maintaining high quality in fabrication despite the influx of new workers, particularly women, who can only develop a sense of mechanical values through long experience. One instance of this situation comes up in connection with the driving of rivets with small air tools in the assembly of aircraft fuselage sections. Green operators tend to over drive rivets and flatten the heads or under drive and only partially head the aluminum rivet. Or they may proceed cautiously and waste time in withdrawing the gun, after a series of blows, to observe the effect on the head.

"Time-Air" is the name given a new product developed by the Murray Corp. of America, Detroit, for positively assuring the proper riveting time cycle. Attached to the handle of a portable riveting gun, the device can be controlled either automatically or manually. It limits the number of blows delivered by the plunger to a predetermined amount each time, thus consis-

tently producing rivet bucktails of uniform height and diameter and avoiding re-hitting or over-hitting, which requires drilling out and replacement of rivets. The device incorporates an air cut-off and a bellows arrangement which assures uniform driving pressure until the last blow is delivered in the cycle.

Time cycles are set by turning a small knurled head screw. Pressure can be regulated for thin or soft material by turning another knurled screw. The standard trip-up cycle is initiated by fully depressing the trigger on the device with the little finger while the regular gun trigger is depressed with the index finger. When the operator pulls the trigger slightly back, the hammer operates as long as the trigger is held in this position, thus permitting trim-up or an occasionally longer cycle.

The Chicago Pneumatic Tool Co., New York, has purchased manufacturing and selling rights on the Murray Time-Air device and will place it on the market shortly. The design is credited to Murray research director Alfred Haberstamp and his associates, Lowell Freeman, Alfred Comstock and Henry Polie.



THE Murray "Time-Air" attached to the handle of the air gun assures a predetermined number of blows to drive each rivet. Close-up of the device (below), showing the auxiliary trigger for initiating the air timer.



How to Choose Electroplating Equipment

By ADOLPH BREGMAN
Consulting Engineer, New York

... Much literature is devoted to the chemistry and metallurgy of electroplating, but little is known regarding the equipment available. Herein, the author completes his analysis of plating barrels, with data on oblique barrels, contacts, anodes, etc. Last week, attention was given to generalities regarding barrel construction and technique, and particular details on horizontal barrels.

The contacts may be buttons, dangles, flexible contacts or simply a rod sticking into the work. (The subject of contacts will be discussed later in this article.)

For large capacity, high production work a special design perforated oblique type plating basket is used in one full automatic small parts plating machine. This machine is so designed as to incorporate cleaning, pickling, plating, rinsing and drying operations in one

OBlique barrels are made in two types. One is the rubber covered steel cylinder or solid wall type. These units are built in either the single or multiple types. The cylinders have diamond shaped or button type contacts in the bottom of the cylinder which are connected to a bronze star ring on the inside of the barrel. In one type of barrel only three of the energized buttons are in contact with the work and current while plating is going on in order to obviate any deposition of metal on the inactive buttons that get into the solutions.

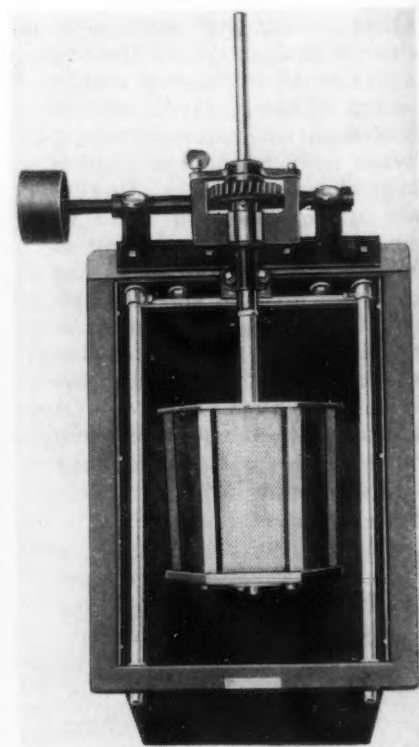
The other cylinder is the perforated wall type in bakelite or rubber, round or hexagon in shape, with pin or disk type contacts.

The solid-wall oblique barrel is useful primarily for its flexibility and because of its applicability to very small parts which would pass through the perforations of the horizontal barrel. Properly constructed, it is rubber, composition or bakelite covered and perhaps

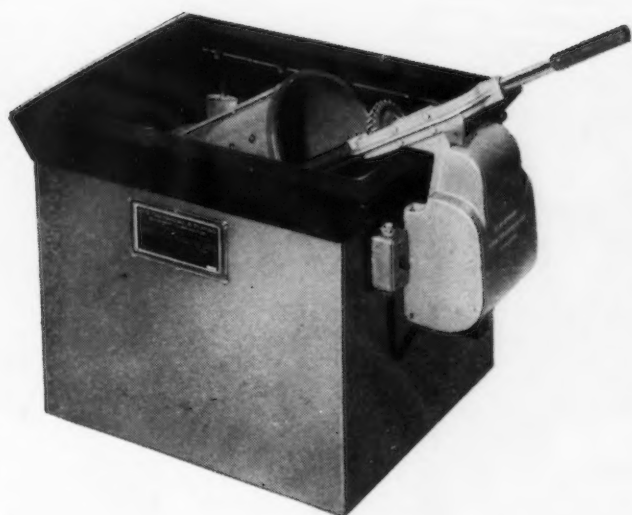
ribbed, and easy to clean. Thus, it can be used for a variety of solutions and after thorough cleaning, can be changed over from some types of plating to others with comparatively little inconvenience.

Its capacity in the "utility" sizes is limited to about 10 lb. of work. The maximum current carrying capacity of this type of oblique barrel is about 50 amp. Where larger output of very small pieces is required, the practice is to add additional oblique barrels to the installation. The most practical loads are from 10 to 45 per cent of the cubic contents.

The perforated wall oblique cylinder has substantially greater capacity, up to 25 and even 50 to 60 lb. in some cases. This type of barrel has a plating efficiency and yields a uniformly plated product comparable to the output of the horizontal barrel. It may have a current capacity of 75 to 100 amp. and be used for building up substantial deposits (of copper, for example).

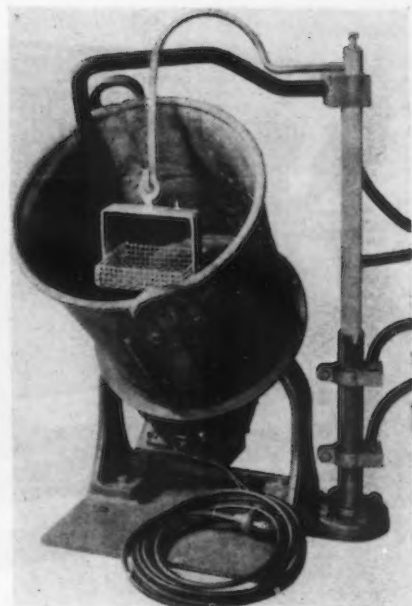


OBlique perforated wall barrel, 25 lb. capacity. (Courtesy Hanson-Van Winkle-Munning Co.)



LEFT
OBLIQUE perforated wall barrel in operating position. (Courtesy U. S. Galvanizing & Plating Equipment Corp.)

RIGHT
"JUNIOR" barrel plater, burnisher and tumbler, showing basket anode holder. Capacity—1 quart of work. (Courtesy Lasalco, Inc.)



unit. Equipment of this type has been built with capacities ranging from as low as 1000 lb. per hr. to a machine with a capacity of 10,000 lb. per hr. (turning out 210,000 lb. in 21 hr.), the latter being a zinc plating machine.

The plating basket or cylinder used is made of perforated steel, rubber covered, with perforations applicable to the type of work to be processed. A specially designed screw type bottom provides for thorough mixing of the work, and equal distribution of the deposit is one of the major features.

The average plating basket load, such as bolts, cap screws, nuts, etc., would be from 40 to 60 lb., depend-

ing upon the characteristics of the part; light stampings are of course based on the square foot area and displacement rather than weight.

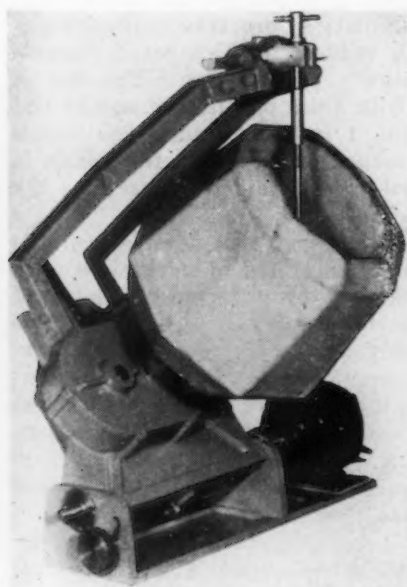
The plating basket is bolted to the bronze carrier arm assembly, and of course rotates continuously during the entire cycle of operations.

The contacts are dangles, which are of special design, revolve continuously with the plating basket and the work, and make their solid connection to the current carrying copper shaft which is incorporated in the bronze carrier arm assembly. The current is taken from the cathode track on the machine by means of a bronze shoe attached to the

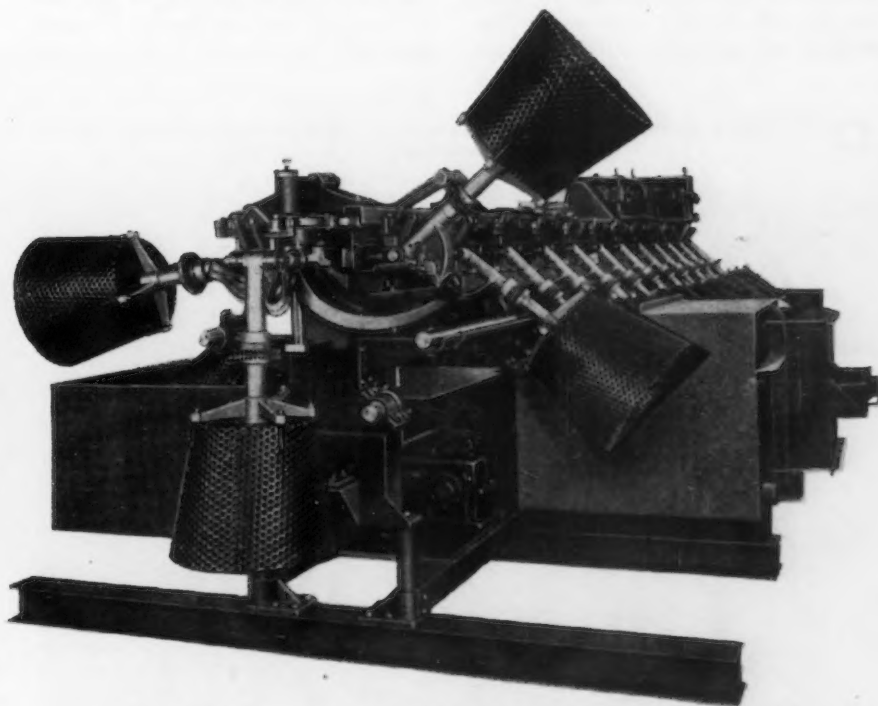
carrier arm, and carried from the shoe by means of braided copper shunts to the copper shaft.

The bronze carrier arm assembly is thoroughly insulated from the mechanism at both the chain bracket or pivot point and the hardened steel tapered roller which actually carries the weight of the arm assembly.

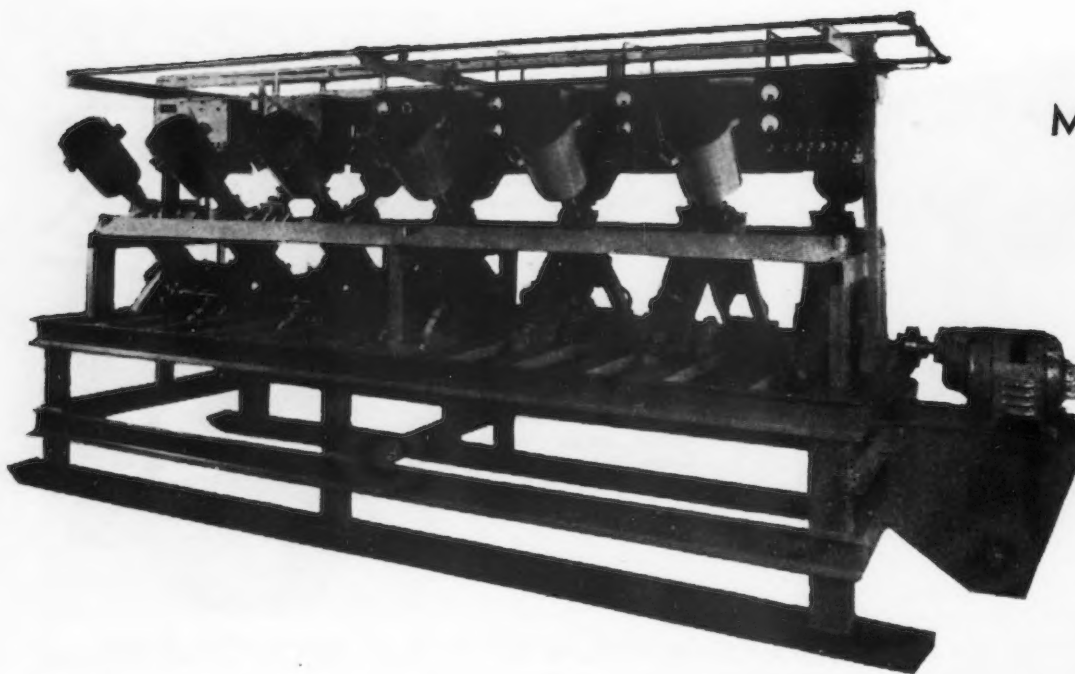
Another interesting variation is an oscillating oblique barrel, in which the cylinder rotates about its main axis, and oscillates about another axis, lying at one side of the tank, above the solution. This combination gives the work a compound motion.



MERCIL type oblique plating barrel. (Courtesy Hanson-VanWinkle-Munzing Co.)



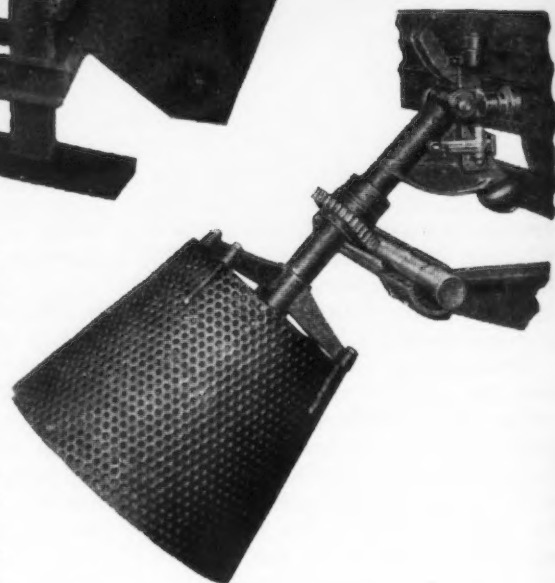
Automatic small parts plating machine. (Courtesy Frederic B. Stevens, Inc.)



LEFT
MULTIPLE, 12-barrel oblique plating unit. (Courtesy Mun-ning & Munning, Inc.)

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BELOW
CLOSE-UP view of rotating basket for holding small parts. (Courtesy Frederic B. Stevens, Inc.)



One of the most important features in any barrel construction is the design of contacts for carrying the current from the work back into the circuit. These contacts are of three general types:

- (1) Danglers and flexible contacts
- (2) Buttons in staves
- (3) End contacts

The subject of contacts is a moot question: Whether danglers are better than buttons; which types of danglers are best; which types of buttons are best. The advocates of danglers state that they minimize the loss of current caused by the coating of contacts with the de-

posited metal; and that it is possible to carry a greater number of usable amperes with the dangler type of contact than any other type, because the loads will carry a higher amperage.

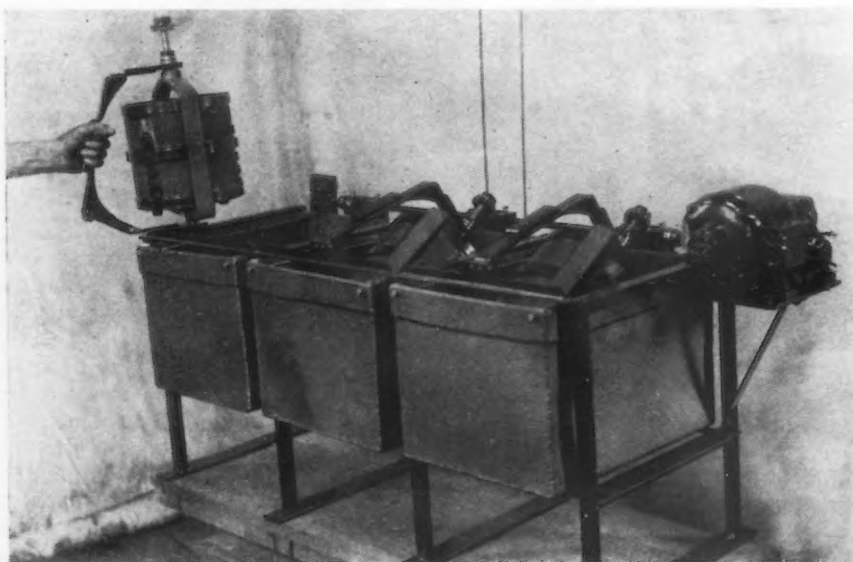
One manufacturer cites the fact that 95 per cent of the contacts which they sell are danglers of the flexible ball type, consisting of a heavy copper cable on the end of which is the chrome plated ball. The cable is easily removed from the inner contact of the barrel and the excess deposit is easily removed. This design is put forward

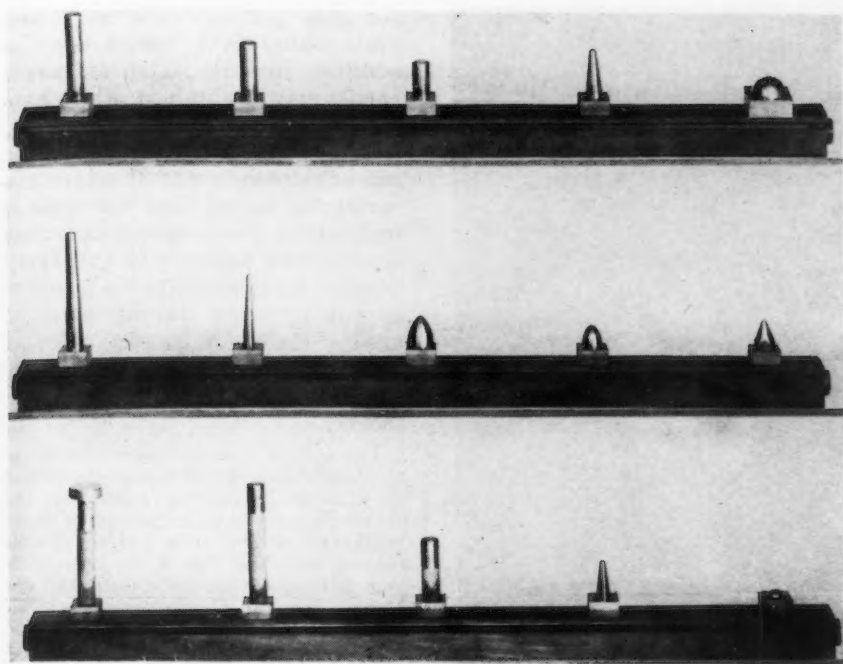
as a marked improvement over the button type of contact on which the plate builds up, necessitating hammering on the button, thus risking splitting or cracking of the cylinder or molded rib. This barrel features sturdy construction: The use of 1/2 in. thick panels, 2 in. square ribs and 1 in. thick ends. The special method of mounting the panels in the ribs is said to insure long life of the ribs.

Danglers and flexible contacts are best suited to small-sized work as they project into the mass of parts, helping to stir it up thus preventing nesting. The disadvantage cited against them, however, is their loose or disjointed construction which cannot carry a high positive contact and their tendency to build up with plated metal and break off after some use.

Button in staff contacts are desirable for many types of barrel work. They can be designed to project into the work and help stir it up and they can be used in sufficient number to provide ample outlets

OSCILLATING barrel, 3 cylinder unit. Load 1/2 to 10 lb. (Courtesy Daniels Plating Machine Co.)

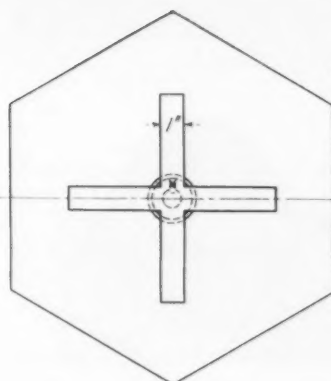
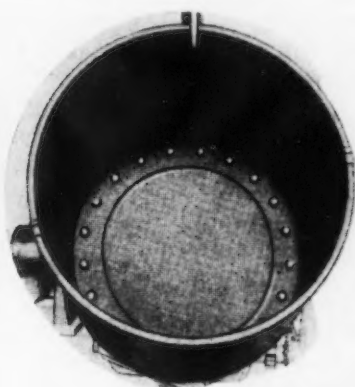




A VARIETY of button contacts. (Courtesy Hanson-VanWinkle-Munning Co.)

for heavy current capacity. It is most important that they be carefully set and perfectly fitted, and so maintained in operation, to prevent leakage of solution through the staves of the barrel, which would be followed by deposition of metal from the solutions within these staves, and eventual disruption of the barrel. The chief defect of this type of cylinder is the moving bearing contact under the solution. After wear, the contact becomes poor and treeing on the end

OBLIQUE solid-wall barrel showing chrome-plated button contacts. (Courtesy Belke Mfg. Co.)



Special star contact. (Courtesy Hanson-VanWinkle-Munning Co.)

of the cylinder steals current from the interior of the barrel.

It is, therefore, vital to prevent treeing or building up of the contacts. They should be cleaned of deposit at frequent intervals and not allowed to build up. If cleaned often, the deposit may be removed by a mere tap of a hammer. If the deposit is allowed to build up too high, it will be necessary to use a chisel to remove it, thereby disturbing the close fit of the contact, and eventually causing trouble.

End contacts are particularly useful with small work. Such contacts can be used at either one or both ends of the barrel (generally both) and made in any desired special shape such as disk, star, cross, cone, etc. With this type, no work can lodge between the shaft and the side walls of the cylinder and keep from tumbling.

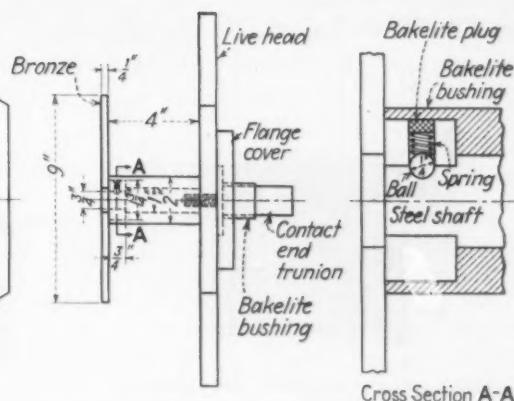
The same care must be exercised in keeping end contacts clean as with buttons or staves. They are however, more easily removed, having only one bolt, and all the current enters the inside of the cylinder, where it should be.

The disk and fixed dangler contacts are rigid whereas button contacts depend upon a rotating contact inside the head or just outside of the cylinder.

Theoretically, all three types of contacts could be used simultaneously. In practice, however, this has been found unnecessary. The special contact of proper capacity is chosen to suit the special work under consideration.

Anodes

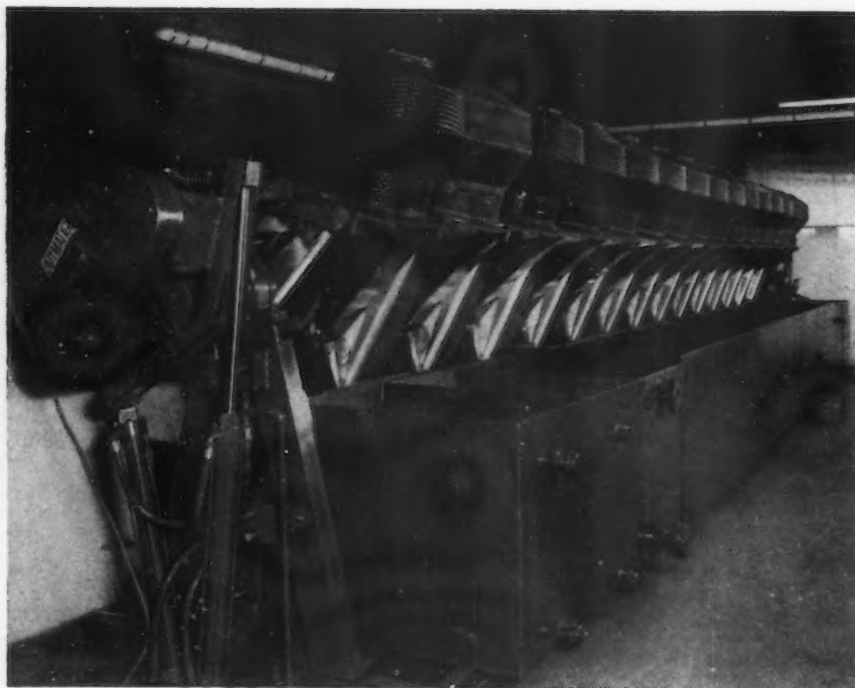
A word on anodes is in order. Numerous types are available, as



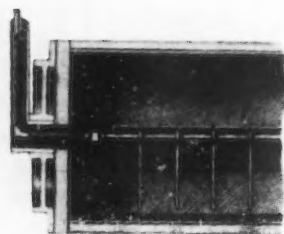
Cross Section A-A

HIGH tension spring pushed contacts. No current conducted to buttons not in contact with work. (Courtesy Belke Mfg. Co.)

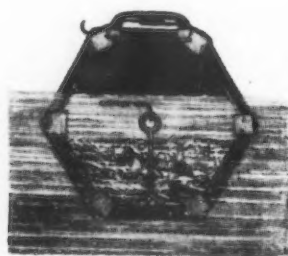




FULL automatic oblique barrel installation. The cylinders are of rubber-covered steel, used in all solutions. Loads may be as high as 30 lb. per cylinder. (Courtesy The Udylyte Corp.)

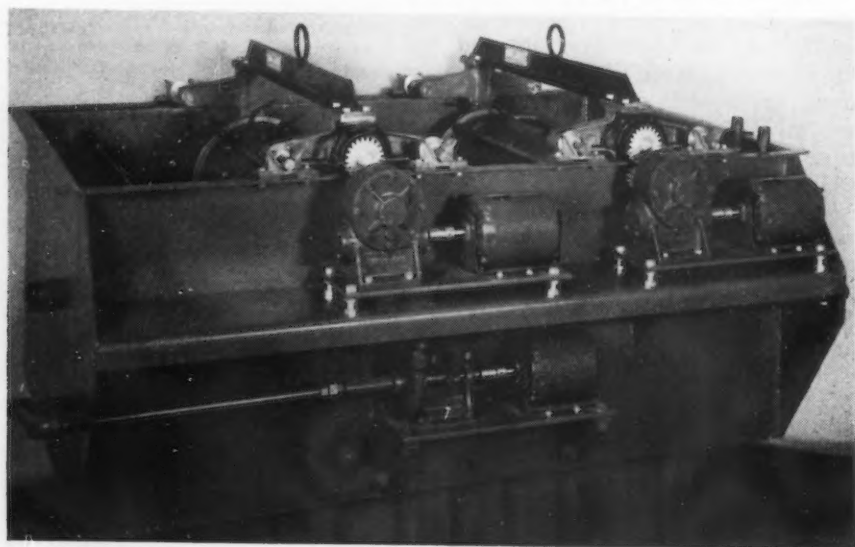


CCROSS section of horizontal cylinder showing mounting of free-turning danglers. (Courtesy Belke Mfg. Co.)



HORIZONTAL barrel with chrome-plated danglers. (Courtesy Belke Mfg. Co.)

ALINE-UP for cleaning and pickling by tumbling. Note the overflow and the circulating pump which helps to keep the surface clean of oil and grease, causing them to accumulate at the top of the overflow dam. (Courtesy, The Udylyte Corp.)



for still plating, such as plates, ovals, balls, disks, quoits, etc. In addition, in some instances, curved anodes may be obtained, which have some advantages over the straight, if of the proper curvature for the size of cylinder used. However, the variety of barrel sizes has made it impractical for anode manufacturers to stock patterns to suit every barrel. Consequently, the practice is now common to use straight anodes (balls, ovals, etc.) because of their easy availability, and the fact that they are generally satisfactory.

The author acknowledges gratefully the assistance of the manufacturers of plating barrels in supplying the illustrations and descriptions of their machines shown here. Also special thanks are due for their assistance and advice, to Joseph Claffey of the Mercil Plating Equipment Co., Chicago, Ill.; Edmund Hanlon and E. N. Pike of the Hanson-Van Winkle-Mun-ning Co., Matawan, N. J.; A. P. Mun-ning of Munning & Munning, Inc., Newark, N. J.; G. T. Potthoff of the U. S. Galvanizing & Plating Equip-ment Corp., Brooklyn, N. Y.

Study of Cast Iron at Elevated Temperatures

In accordance with its policy of encouraging the use of substitute materials, the WPB has approved a field research project to study the possibility of utilizing cast iron in operations at elevated temperatures (in excess of 450 deg. F.). This program is being conducted by the War Metallurgy Committee, National Academy of Science, with the cooperation of the American Foundrymen's Association. T. E. Barlow, Vanadium Corp. of America, and C. O. Burgess, Union Carbide & Carbon Research Laboratories, have been appointed to obtain data. Since time is vital, these men have requested the cooperation of industry in locating specific applications in which cast iron is being or has been used, successfully or otherwise, at temperatures in excess of 450 deg. F. Actual details of operation will be kept confidential when desired.

Engineers, foundrymen, field service men and others can make a valuable contribution to industry and the war effort by contributing their knowledge and experience to this study. Detailed information or suggestions as to possible sources should be sent to: T. E. Barlow, 2440 Book Bldg., Detroit; or, C. O. Burgess, 4625 Royal Ave., Niagara Falls, N. Y.

Carbide Tool Crib System

By THOMAS E. LLOYD

Cleveland District Editor, *The Iron Age*

Used by Warner & Swasey

A CENTRALIZED control system for carbide cutting tools has been worked out by Warner & Swasey Co., Cleveland, one of the nation's largest producers of machine tools, that not only keeps close check on the tool inventory but maintains a tool grinding and sharpening setup that assures the best performance possible from carbide tools. The system permits a close knowledge of actual operating requirements throughout the plants, permitting the coordination of tool design, operation and maintenance.

The tool crib for carbide cutters was segregated from the regular tool cribs at Warner & Swasey soon after the use of this type tool was started in the plant. It was quickly discovered that to properly use carbide tools and to get the most from them, carbide tool specialists must introduce them to machine operators and educate these operators in the capabilities of the tools. It was found that too frequently the benefits that could be derived from the use of these tools were defeated by faulty grinding of the cutters, improper machine speeds, or improper feeds. Operators were not accustomed to these tools and had to be shown how to use them. Furthermore, the machine operator had previously always been responsible for the condition of his own tools, sharpening or replacing them as he saw fit. Normally, every machine operator had his own choice and his own peculiarities in grinding tools for his machine, but in the use of carbide tools it was found that there is one grinding procedure that permits the maxi-

... Through the use of a centralized tool crib, better maintenance and closer inventory control of carbide cutting tools used in Warner & Swasey plants as well as more satisfactory service and speeded production from these tools have been achieved.

mum results to be obtained from the tools.

The organization of the carbide tool crib was turned over to one man at Warner & Swasey. His first move was to take the grinders out of the shops and stop operators from grinding carbide cutters. The crib was set up with the necessary equipment to keep all cutters used in the plant in proper condition. At the present time there are installed in the crib two rough grinders, one an Ex-Cell-O 10 in. and the other a Hammond 12 in. grinder; three standard Ex-Cell-O bench grinders with 6-in. wheels, one of which is used exclusively for hand scrapers; a K. O. Lee grinder for cutting chip breaker grooves; two Cincinnati universal cutter and tool grinders for reconditioning milling cutters and other multiple point tools; a Blount wet grinder for grinding tool shanks; a new Bura-Way grinder that will be used for both carbide and high speed steel cutters; and a Van Norman vertical milling machine that is used for milling cast iron shanks which are used for many of the carbide single point cutters.

The tool crib is staffed by 20 men, including grinders, setup men, brazers, and trouble shooters, who work on a three shift, 24-hr. day program. The crib han-

dles the sharpening, storing and distribution of every carbide tool used in all of the Warner & Swasey plants. Furthermore, the crib is responsible for the milling of cast shanks and for brazing of all carbide tips to the tools. All single point tools are hand ground and the multiple point tools are machine ground on the Cincinnati grinders. The practice of hand grinding shown in Fig. 1 was chosen for single point tools because it was found that when tools are ground while held in vises, their rigid position against the grinding wheels often heated the tools to a point that they would crack or chip. Machine grinding, however, is used in sharpening multi-edged tools as shown in Fig. 2.

During a normal three-shift day, more than 1200 single point cutters and 700 multiple cutters are handled. Some of the machines on which the various single point cutters are used in the plants are: Turret lathes, engine lathes, boring mills, planers, precision borers, automatic turret lathes, and millers. A great number of carbide hand scrapers are also reconditioned here also.

In the multiple tip tool classification, among those ground regularly every day are some 150 step



FIG. 1—Grinding a single point carbide tool. The carbide tool crib system used by Warner & Swasey permits greater economies in the use of these tools and is operated as a specialized service department to service all of its plants.

and flat cutters for boring mills and turret lathes; 125 inserted tooth face and side milling cutters for boring mills and milling machines; and some 50 end mills, dovetail, T-slot, and stagger tooth cutters, and straddle mill cutters for use on milling machines.

Cast Iron Shanks

For most single point tools, the shanks are made of cast iron. These shanks are cast especially for Warner & Swasey from same material from which machine beds are cast. These cast shanks, used primarily for turning tools, have been found to be considerably more economical than steel shanks, since all that is necessary to put them into shape for brazing on the carbide tips are milling operations on the top and bottom to obtain flat surfaces and milling the top clearance and the recess for the tips. Flat milling is done at high speed with a single fly cutter in the vertical spindle. Top rake is obtained with an end mill, with the head tilted at the desired angle. Recess is cut in the same way.

As these shanks are cast rather close to finished form, the milling operations are much more simple

than the machining that would be necessary on steel shanks. The front and side clearance angles are simply cast at an angle greater than that desired on the tip and these surfaces are not machined. A completed single point carbide cutter with a cast iron shank can be made cheaper than a cast cobalt-chromium alloy or a high speed cutter can be purchased. However, for planer tools and those that must withstand considerable shock, machined steel shanks are used.

Tool Distribution

In handling the distribution of the carbide tools, each cutter is issued against the particular machine that uses it rather than against the machine operator. Thus, on three-shift operation, no one person is responsible for the tools used on a machine, each operator on each shift sharing in the responsibility. Tools generally are delivered by crib men to the jobs. When a job is being set up in a machine, the foreman calls the crib and specifies what tools or cutters will be required. The crib department tries to maintain a 20 to 30 min. service on such calls. However, occasionally, such

as with tool breakage on a job, there is an immediate need for a specific type cutter. In such cases, usually the machine operator will call or send to the crib for the tool he needs. In this manner, more than 300 machines that use carbide tools in the three Warner & Swasey plants are serviced.

A card control system is employed by the company to maintain accurate records on tool use. The time study department analyzes every job in the plant and all of the different type tools needed for the job are listed on light green 5 x 8-in. cards. On one side is listed all the operations, speeds, feeds and standard rates and on the other the tool and gage numbers and descriptions. One copy of each card is given to the tool supply department, the department that does the job, and to the carbide tool crib, and the master copy of the card remains in the time study department. Any changes in the job must be reported to the time study department so that appropriate changes or corrections can be made on the cards, and no alterations on the cards are permitted by anyone except the time study department. This permits a very close check not only on all of the jobs in the plant, but also on the various types, sizes and kinds of tools necessary to do these jobs.

Naturally, the tool crib is interested only in those jobs requiring carbide tools. However, the file of cards shows all of the jobs in the plant and with each job, of course, is listed the carbide tools required. Thus, the tool crib can quickly determine whether a request for a carbide tool is valid for the job to be done.

Inventory Continuous

A continuous inventory, checked weekly and recorded on a master inventory list, permits the maintenance of accurate records of all carbide tools in stock. The various cutters are listed according to their specific classifications, and as new ones are added to the stock they are recorded in the inventory. Likewise, as cutters wear out and are discarded, they are taken from the inventory. By maintaining this constant and up-to-the-minute check, there is little chance of either overstocking or running out of any particular tool.

A machine inventory check list is also maintained by the crib that shows immediately what tools or cutters are out of the crib, charged

As the tools are returned to the crib for regrounding or reconditioning and stocking, the machine to which they are charged is checked off as having returned the tool.

In this manner, many of the difficulties that arose with the innovation of carbide tools and cutters to the Warner & Swasey plants were minimized. The system has not only proved its worth in maintaining closer check and more accurate records of the tools and cutters in use on the various machines in the plants, but has aided in educating machine operators in the proper use of carbide tools and has helped speed up production.

Through using the centralized tool crib system for carbide tools, considerable savings have been effected not only in the cost of tool replacement, but also through the speeding up of machine time on many jobs. First, there is the saving of the operator's time that normally would go into tool grinding. Furthermore, it is estimated that from 30 to 40 per cent of cutting time has been saved in actual production runs through the use of the centralized control of tools. This has been the result chiefly of the program of machine operator education in the use of carbide tools and cutters. Proper machine speeds and feeds have been arrived at by careful studies made by the tool crib personnel, and maximum efficiency of both the machine and cutting tool is now regularly being achieved. Many of the tool designs, angles, etc., have been worked out in this department.



FIG. 2—Dressing inserted carbide blade milling cutters with a diamond impregnated cup wheel. A crew of 20 men handle grinding, maintenance, and stocking of all carbide tools used in Warner & Swasey plants through the tool crib system.

• • •

FIG. 3—An index, by department, of all machines using carbide tools and their numbers used in all plants is maintained in the tool crib for the purpose of keeping a record of outstanding tools. As tools are taken out, they are charged (pencil entry) against the machine by tool number, and as they are returned, the charge-out is crossed out. New sheets are made up every few days.

LATHE SECT		MILLING DEPT	
MACH	EQUIP	MACH	EQUIP
LATHE	1555	HORI-ZONTAL	1798
"	1886	"	1644
"	1576	"	1800
"	1575	"	1821
"	1698	"	1784
"	1881	"	1741
"	1642	"	1402
"	2064	"	2023

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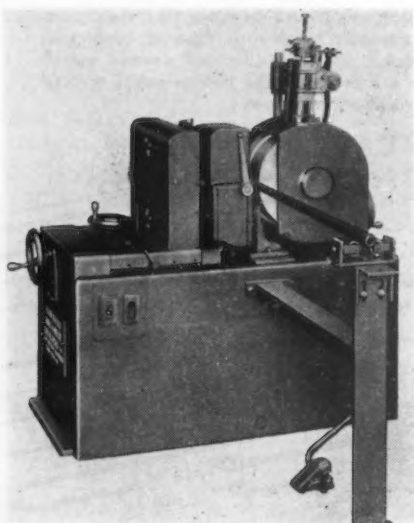
New Equipment . . .

Finishing

Here are described some of the newer developments in polishing, cleaning and degreasing apparatus, as well as new enamels, paints, coatings and finishing machines.

Cylindrical Polishing Machine

AN o.d. cylindrical finishing machine is now being built by *Hammond Machinery Builders, Inc.*, 1612 Douglas Avenue, Kalamazoo, Mich. The machine has a range feed of 0 to 50 ft. per min. for 1 in. diameter, forward or reverse, and handles parts from 1/4 to 9 in. o.d. A quick release lever enables the operator to control the work being fed through the machine by disengaging the work from the face of the wheel. The



work support is adjustable to the wheel by quick means for work of varying diameters. All parts of the unit are guarded and readily accessible. The guard cover can be quickly removed for changing wheels and abrasive belts.

Polisher and Buffer

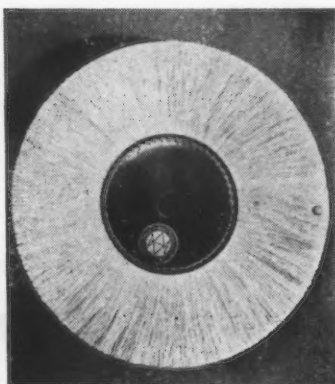
ANEW heavy-duty polisher and buffer has been announced by the *Hisey-Wolf Machine Co.*, Cincinnati. Standard open motors are mounted inside the base. The machine is built in the single spindle, single motor type, as well as a two



motor style, with motors from 3 to 10 hp. capacity. The illustration shows open type spindles, but the encased type can also be furnished with a housing about the spindle extension with a ball bearing directly adjacent to the wheel.

Wire and Tampico Brushes

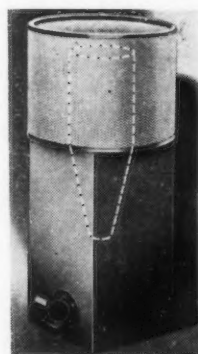
THE HANSON-VANWINKLE-MUNNING CO., Matawan, N. J. has developed new types of wire brushes and tampico brushes for cleaning, polishing and finishing metals. The wire sections are made in sizes from 6 to 15 in. in diameter. Each section is approximately 3/8 in. thick and is mounted directly on a shaft without the use of a hub or adapters. Any size arbor hole can be punched out as



wanted. The Staplbond Tampico sections, illustrated, are made of heavily filled, white tampico fibre, held in place by a triple ring of wire. These sections are approximately 1/2 in. thick and any number can be assembled directly on the shaft to make the required width of face needed.

Dust Collecting System for Polishers

ACYCLONE-FILTER type, self-contained dust collector, having a 1250 cfm. capacity which is adequate to exhaust dust-laden air from large wheel buffers, polishers and grinders, is announced by *Aget-Detroit Mfg. Co.*, 2040 Book Building, Detroit. Known as model 1250 Dustkop, the collector employs a cyclone to collect most of the dirt and dust drawn in. A spun glass filter is used to clean the air further.

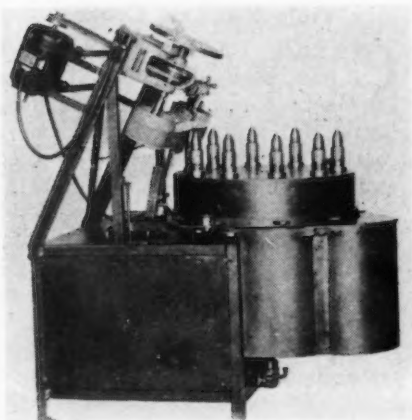


A 1 1/2-hp. motor drives a multiple-bladed fan which draws the dust-laden air to the cyclone. The unit is available with either one-way or two-way intake ports and for connection with flexible metal hose or pipe.

Shot Polishing Machine

AMACHINE which polishes 1000 37-mm. shot tips per hour has been developed by *Leiman Bros.*, NA-144 Christie Street, Newark, N. J. The machine is so arranged that a number of rotating chucks, mounted on a rotating wheel, hold the parts to be polished. The chucks are loaded at a point where they automatically stop rotating. The wheel indexes intermittently, bringing the work against

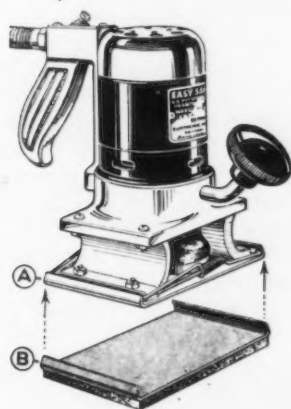
NEW EQUIPMENT



the running abrasive belt where it is polished. The abrasive belt has a range of three speeds. Two small motors drive the chucks and the wheel.

Reciprocating Sanding Machine

THE reciprocating action of the model XLD Easy electric sanding machine, made by the *Detriot Surfacing Machine Co.*, 7433 West Davison, Detroit, duplicates the back and forth motion of hand work. Speed is 3000 strokes per min. and power is furnished by an electric motor in either 115 or 230 volt models. The sanding pad is



secured to a detachable bottom plate, over which the abrasive is attached. Detachable bottom plates are available with pads of sponge rubber, felt, or composition in widths from 1 to 3 1/4 in. and 1/4 to 1 in. thick.

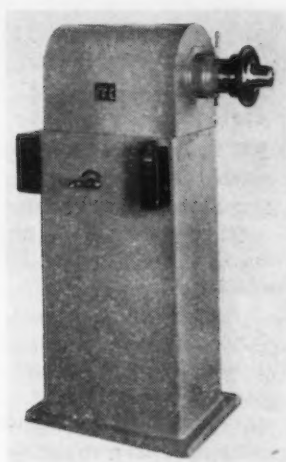
Adhesive for Polishing Wheels

A NEW type of adhesive has been developed as a substitute for glue in facing polishing wheels by the *Hanson-Van Winkle-Munning Co.*, Matawan, N. J. It is called the H-VW-M adhesive, and is used the same as glue. The consistency is

suitable for coarse abrasives such as No. 60 grain. For finer grain sizes, water is added to dilute. Unused material may be reheated without waste.

Variable Speed Lathe

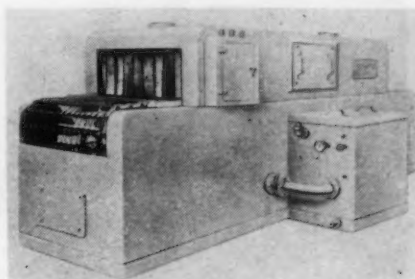
FOR finishing, burring, filing, lapping or polishing, the *Schauer Machine Co.*, 2069 Reading Road, Cincinnati, announces a lathe especially designed to increase the output of finished screw machined parts up to 1 3/8 in. in diameter. A Sjogren chuck operates a spring



type collet which is quickly adjusted to the size of the work by means of a handwheel mounted on the chuck. Motor speeds range from 20 to 4000 r.p.m. Speeds are in ratio of 6:1 for single speed motors and 12:1 for two speed motors. Variation in spindle speeds is obtained by movement of a variable pitch pulley controlled by a ball crank.

Metal Washing Machine

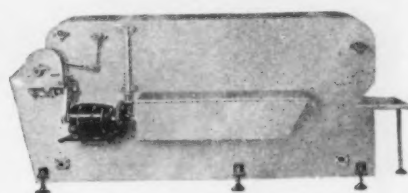
THE Magnus Emulso-Spray machine has been developed by the *Magnus Chemical Co.*, Garwood, N. J. The first section of the unit is a solvent wash at room temperature; the second section is a water spray rinse at room temperature;



the third section is for hot air drying when needed. A low-cost petroleum solvent is used. The process is very effective for removal of oily dirt from metal surfaces.

Metal Parts Washer

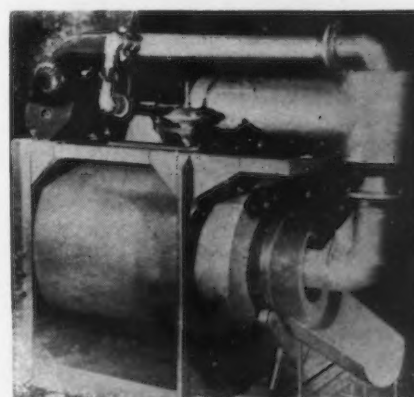
STURDY-BUILT EQUIPMENT CORP., 1441 South 65 Street, Milwaukee, announces a new metal parts washer for the soaking, wash-



ing, drying and preparation of metal parts, either machined, finished or rough; and for complete metal assemblies. The parts are subjected to a long soaking in very hot light alkali solution, followed by very hot and clean water washes and rinses. Parts are thoroughly dry before reaching the unloading platform. A "chip-remover" scrapes chips into a receptacle at one end.

Drying Mechanism

A SALIX dryer has been developed by *Salem Engineering Co.*, Salem, Ohio, for use in connection with its annealing furnaces. Materials may be charged into the dryer by means of the individual feeder equipment or the unit may be used with a continuous line of



other equipment. Materials are conveyed through the dryer by an internal screw and are tumbled as they are dried. The capacity for small steel parts runs up to 9,500 lb. per hr. Drying is accomplished by hot air blown into the interior of the perforated drying drum.



Parkerizing Unit

A COMPLETE parkerizing unit, which eliminates manual labor in putting work through parkerizing, rinsing, chromic acid rinsing, flow-off, oil dipping and drying, has been announced by *N. Ransohoff, Inc.*, Cincinnati. The drum is so built that it holds a level of liquid within approximately 3 in. of the center. It also permits continuous circulation of the parkerizing solution without agitation between the drum and the heating tank to maintain constant temperature of the liquid in the drum. The machine can be arranged for steam or gas heating. It is shown above.

Mechanical Parts Cleaner

A MOVABLE mechanical parts cleaner which provides continuous filtration of the cleaning solvent has been announced by *Practical Products Co.*, 1629 University Avenue, St. Paul. This Klee-Flo cleaner incorporates a semi-rigid hose, made of galvanized steel, which can be located in position over the work and will hold this position without further attention, leaving both the operator's hands free. Work tray is constructed to give quick draining, but does not permit the smallest part to become lost. A filter on the pump provides a constant flow of solvent free of sand or grit. Any standard cleaning fluid can be used with this unit. Two sizes are available, 18 x 24 in. with 10 gal. capacity and 24 x 36 in. with 20 gal. capacity.

Surface Coating Resin

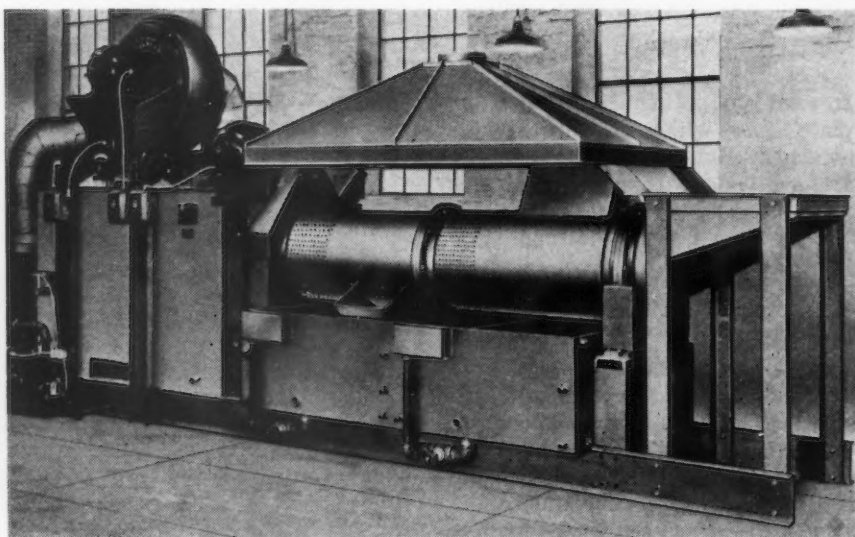
A NEW and improved type of vinyl resin for corrosion-resistant maintenance finishes and other coating applications has been announced by the Plastics Division of *Carbide & Carbon Chemicals Corp.*, 30 East 42nd Street, New York. The new resin, identified as Vinylite Resin VMCH, adheres to a wide variety of surfaces. It is quite similar to vinyl chloride-acetate resins and is completely compatible with the other grades, and may be blended with them in actual use. The major field for finishes based on the new resin is believed to be in air-dry coatings for maintenance work, coating industrial buildings and equipment exposed to very corrosive atmospheres. Test finishes based on Resin VMCH show excellent performance over magnesium and aluminum alloys, particularly on salt water immersion.

Protective Tank Coating

CARBO PETRO-NON-SOLV has been developed by the *Carbozite Corp.*, First National Bank Building, Pittsburgh, as a coating to protect concrete or wood storage tanks against the infiltration into their contents by gasoline and oil. This new coating contains no oil, therefore it will not saponify when in contact with cement or mortar. One of the unique features is its inertness to petroleum, coal tar and manufactured solvents, organic and inorganic oils and fatty acids. Two or three applications are recommended, depending upon the porosity of the surface to which it is applied. It is available in red, white, green or blue and will dry hard within 2 or 3 hr.

Metal Cleaning Equipment

THE revolving drum Colt Autosan, made by *Colt's Patent Fire Arms Mfg. Co.*, Hartford, automatically washes, rinses and dries small metal parts. Parts placed in a hopper are fed in controlled amounts into the revolving chamber through which they are propelled by a built-in spiral. In passing through the machine, parts are washed and then rinsed while being agitated and rolled over and over as a result of the revolving action and construction of the cylindrical drum. During these operations the work is submerged in the washing solution or rinse water within the cylinder. Leaving the rinse section, the parts pass through the drying cylinders where the rolling agitation continues while a forced blast of heated air serves to remove all trace of moisture. (Shown below)



Protective Clothing

ARM guards, aprons, coveralls and overalls made of a strong base fabric especially treated with plastic to resist penetration, absorption and saturation of acids, oils and solvents commonly used in industry, are sold by *Don-Ed Fabrics, Inc.*, 989 Sixth Avenue, New York. These garments, called *Durama-Gard*, can be fireproofed at slight additional cost and may be worn by women as well as men.



Shell Case Finish

ZAPON DIVISION, *Atlas Powder Co.*, 60 East 42nd Street, New York, recently perfected for the Army a new type finish to coat the interior lining of steel shell cases which are now authorized by the government to conserve brass. Known as S-198-C in the Zapon series, the finish protects the inside walls of the shell cases against conditions of use or corrosion caused by the action of powder, rust or other agents.

Machine Tool Cleaning Fluid

CORROSOL No. 26 has been introduced by *International Rustproof Corp.*, 12507 Polver Avenue, Cleveland, to be used for cleaning rust, removing burns, marks, etc., from machine tools. It does not promote the growth of corrosion after treatment and does not act upon the metal itself. The cleaner is used in a cold solution.



Steel Surface Conditioner

THE HANSON-VAN WINKLE-MUNNING CO., Matawan, N. J., has developed a new type product called *Surbrite*, a steel surface conditioner. It is a free-running powder in two types for addition to hydrochloric acid and sulphuric acid pickling solutions. The use of *Surbrite* will reduce acid consumption and metal loss in comparison with pickling practice where plain acid is used. *Surbrite* "H" at 0.5 per cent the weight of 40 per cent hydrochloric acid leaves steel bright and smooth after 15 min. pickling at 110 deg. F. Increases in temperature or acid strength at 110 deg. F. will lead to etched bright surfaces.

Thermoplastic Tank Lining

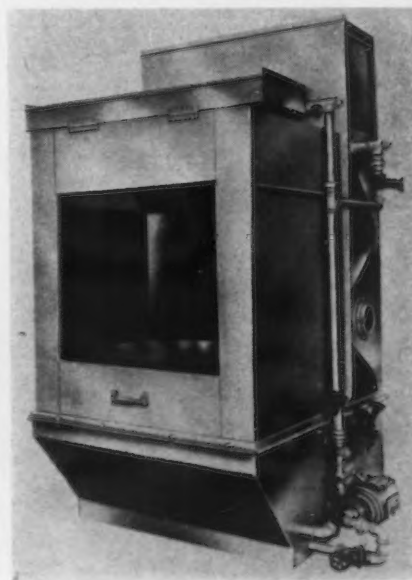
AMERCOAT, a plastic base coating composed of thermoplastic resins, announced by *American Pipe & Construction Co.*, P. O. Box 3428, Terminal Annex, Los Angeles, makes it possible to use concrete as well as steel for tanks and vats for storage of various fluids which ordinarily would cause severe corrosion or costly seepage. *Amercoat* adheres tightly to the concrete surface and is impervious. It produces a smooth, inert surface which is plastic enough not to check, crack or fracture when subjected to vibration and moderate expansion and contraction. Odorless, tasteless, chemically inert and dielectric to a high degree, *Amercoat* is cold-applied and can be brushed or sprayed on metal or concrete without requiring special tools or equipment for application.

Spray Booth Coating

THE detergent department of the *J. B. Ford Sales Co.*, Wyandotte, Mich., has found that by mixing its *Wyandotte Detergent* and water to about the consistency of a good thick paint, it can be brushed on the sides and even the ceiling of a spray booth or even applied with a spray gun. As this dries, it leaves a thin coating all around the inside of the booth to which paint or lacquer adheres. When the inside of the booth is ready to be cleaned, the whole coating peels right off.

Paint Spray Booth

ASINGLE compartment paint spray booth featuring rear and side water-impingement walls has been developed by the *Aqua-Restor Division, Mayer Mfg. Corp.*,



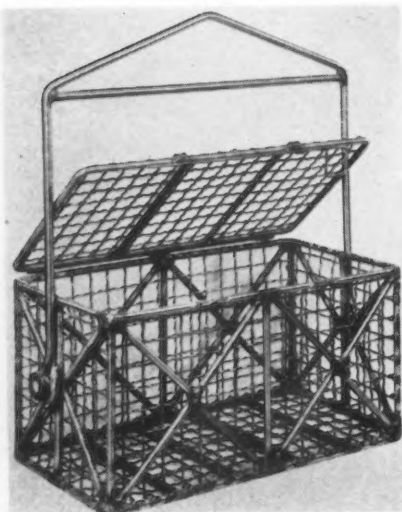
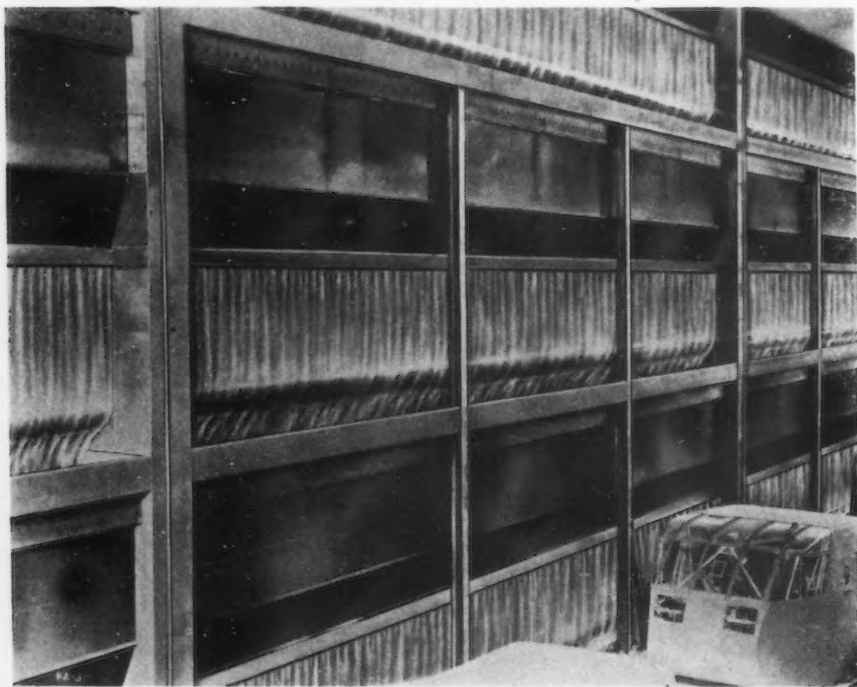
45 Division Place, Brooklyn. Aqua-Restor's super-turbulent water washed walls, through continuous and effectively pressured flow, provide efficiency in spraying operations of all sizes and types. Used water may be drained directly or pumping can be arranged for distant disposal. Unit illustrated is equipped with turn table and fluorescent lighting, and is available in single or multiple units.

Plating Rack Insulation

SYNTHETEX, Type 50, a water-clear coating for use on all metals, produced by *Protective Coatings Inc.*, P. O. Box 56-IA, Strathmoor Station, Detroit, has been tested and approved by plating engineers for all plating solutions, including commercial and hard chrome. It is applied by dipping, brushing, or spraying and bonds tightly when baked at 275 deg. F. for a half hour. It is also used for tank linings and for all electrical units.

Three Deck Spray Booth

BINKS MFG. CO., 3114-40 Carroll Avenue, Chicago, recently installed what is believed to be one of the world's largest three-deck spray booths. This new spray booth is 150 ft. long, and over 30 ft. high. Three sets of water curtains, one above the other, wash the air and carry out the fumes and over-spray in the painting operation.

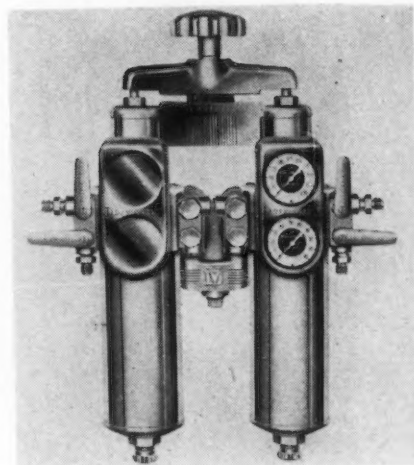


Pickling Basket

A NEW trunnion-type pickling basket, designed to minimize "drag-out" acid losses, has been designed by *Rolock, Inc.*, Fairfield, Conn. This carrier handles 400 to 800 lb. loads of 40-mm. shell cups through a 10 per cent sulphuric acid solution for removal of annealing scale. The basket is constructed so that, after the bath, it may be suspended over the tank and rocked or revolved by hand to drain all cups of entrapped liquids, regardless of their positions. The entire top of the basket is hinged to speed up loading operations. Both frame and mesh are of Monel metal, arc welding being used throughout.

Air Transformer

THE double barrelled type HLC heavy duty air transformer, with a capacity in excess of 100 cfm. has been developed by the *DeVilbiss Co.*, Toledo. Though both function independently, the two pressure regulators in this transformer are simultaneously controlled by a single knob. The filtering and condensing mechanisms are all metal. The diaphragms are made of reinforced oil-proof synthetic rubber and are chatterproof. Connection to the main air line is made at a single inlet port. No more fittings or piping are required than with single tube models.

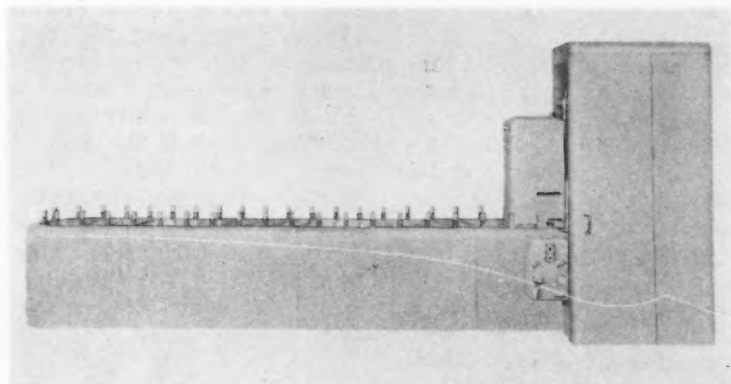


Metal Cleaning Solution

A RECENT formula worked out for difficult metal cleaning of light steel developed by *Philadelphia Quartz Co.*, 121 South Third Street, Philadelphia, uses a 1 per cent solution composed of 19 parts sodium metasilicate (Metso) and 1 part alkyl aryl sulfonate (Nacconol NR). The latter material reduces surface tension and assists the Metso solution in the removal of the grease film with only 2 sec. contact.

Brass Cleaner

TO remove corrosion, scale or black oxide from brass surfaces, Hamico No. 480 Brass Kleen dissolved in water is said to do an outstanding job. This new product, developed for cleaning fuse tips and similar small brass parts, is one of the latest developments of the *Haas-Miller Corp.*, 4th & Bristol Streets, Philadelphia.

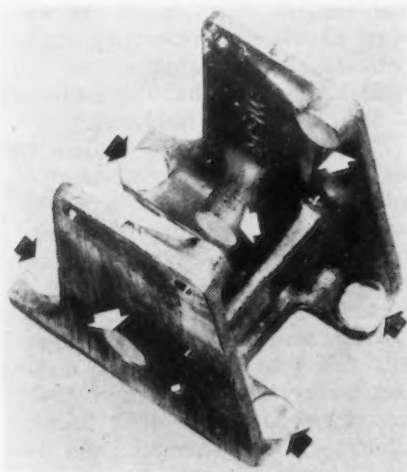


Shell Coating Equipment

A NEW line of high speed automatic shell-coating equipment, capable of handling all of the finishing and coating materials commonly specified for ammunition, has been announced by the *DeVilbiss Co.*, Toledo. Spraying stations are located at one or both ends of the conveyor depending upon specified production rate. On one type, three stationary spray guns are actuated only when each shell moves within spraying range. Another for shells having an inside adaptor has a spray gun with a hook-type extension. This and another moving extension gun coats all interior surfaces while a third moving gun paints the outside. Conveyor length is determined by the drying and handling requirements of each job and either dry or water wash exhaust is furnished.

Masking Labels

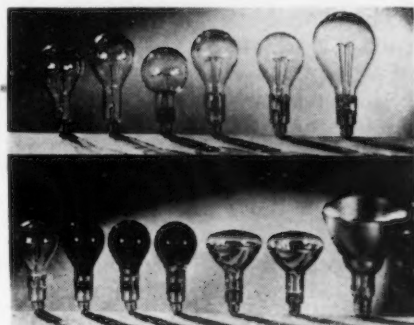
KUM-KLEEN stickers, made by *Avery Adhesives*, 451 East Third Street, Los Angeles, have been found effective for the purpose of masking where the mask area is small. These stickers have a self-adhesive backing and may be easily peeled off after the operation



is completed without scraping or tearing. They are quickly applied without moistening to metal, glass, plastic, wood or any smooth surface. While standard sizes of labels will fit many normal masking jobs, special sizes and shapes are made to specifications.

Infra-Red Heat Lamps

A NEW line of infra-red heat lamps has been announced by the Birdseye Division, *Wabash Appliance Corp.*, 345 Carroll Street, Brooklyn. The line includes six

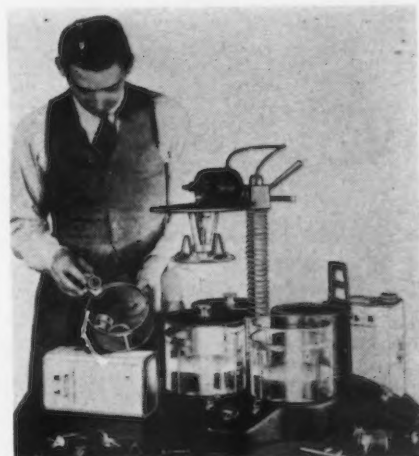


clear types, three ruby types and four reflector types. All feature the M-type tungsten filament and have bases reinforced with asbestos-lined mechanical straps. The reflector types have built-in reflector linings of pure silver sealed inside the bulbs for protection against dimming and tarnishing by fumes or dirt. Average burning life on all is in excess of 6000 hr.

Cleaning Machine for Small Parts

TO speed the cleaning, rinsing and drying process of small precision parts, *L & R Mfg. Co.*, 54 Clinton Street, Newark, N. J., has developed a small cleaning machine and cleaning and rinsing solutions. The disassembled parts are placed in the work basket which is snapped into position on the motor shaft. The basket is lowered into the cleaning solution jar containing

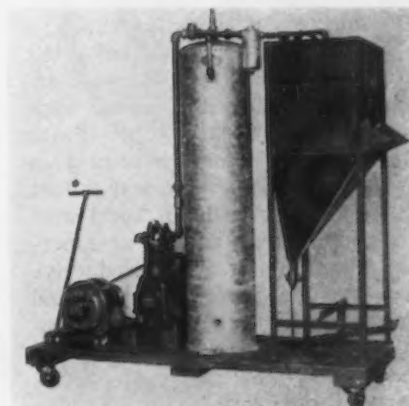
L & R Power Nofome, a non-foaming cleaner. A rheostat on the base of the machine regulates the motor speed. The special gear reduction Dumore motor drives the basket through a 14:1 ratio. After running in the Nofome solution the motor is cut and the basket is raised in the jar above the liquid level and again rotated to throw off excess solution. The jars are of sufficient height to receive the fluid thus thrown off. These operations are then repeated in the second and third jars, both of which contain



the *L & R* rinsing solution. The motor carrier is then revolved to the fourth position which places the work basket over the drying chamber. This contains a separate motor and fan in conjunction with a vitreous heater unit.

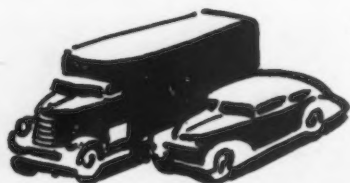
Sand Blast Equipment

A SAND blasting machine of the self-feeding variety in which a small quantity of sand, flint, carborundum, angular steel grit or other abrasive may be placed has been developed by *Leiman Bros., Inc.*, RW-144 Christie Street, Newark, N. J. These machines are made in a number of sizes.



Assembly Line . . .

• Wildcat strikes on the increase . . . Union paper attacks Nelson . . . UAW and CIO assail WLB order . . . Bonuses at Detroit will total \$20 million.



DETROIT—It was definitely coincidental, but moves in the automotive-labor picture last week were knit like the point and counter-point of musical composition. There were indefinite stirrings first which hinted that a continued quiet course of labor relations was unlikely. Right on the heels of those stirrings came a rather hard-boiled indication from Washington that labor would be held more strictly on the path of true virtue from which it has strayed lately.

Take first the ominous stirrings. The number of wildcat strikes in Michigan has been quite obviously on the increase during the past several weeks. There is dissatisfaction among the ranks of the skilled workers over the wage ceilings applied to them in the Detroit area. And the "United Automobile Worker," union publication, has begun a new campaign aimed toward labor's securing a place at the management table, a Stalin-grad-like objective which has been long sought but never captured.

The current issue of the "Worker" appears with a broad attack on Donald M. Nelson, captioned, "Nelson Has Broken Faith With Labor." This editorial goes on to state that "the war effort cannot fully be either a 'total war' or a 'people's war' as long as American labor, the greatest productive force in our nation, is excluded from the councils of the war production agencies."

This is no new drive, of course. The labor-management council idea

was first brought forth by Philip Murray a few years back and since then the issue has sporadically appeared and re-appeared. But this is the first time since the war began that such a bold approach has been made.

THE technique involved suggests that this may not be solely a movement by the UAW, but more rather a concerted attack of the CIO. Most of the factual data leading up to the editorial's conclusion are built from criticisms of CIO President Philip Murray, involving the War Production Board and Mr. Nelson.

Meanwhile, both the UAW and small craft unions in Detroit are vigorously assailing the order of the War Labor Board fixing maximum rates for tool and die makers in the six-county area of metropolitan Detroit. This order establishes maximum wage levels from \$1.65 to \$1.90 an hour in job shops, and sets a "base" of \$1.60 an hour in manufacturing company shops.

This order very ingeniously managed to get the War Labor Board in wrong with both horizontal and vertical unions.

By setting ceilings of \$1.65 to \$1.90 in the job shops, the board incurred the wrath of the craft workers in those plants who don't want to be confined to rates which were lower than the going rates now found in a very few shops, and provided no room for raises in most of the others. On the other hand, the ruling was completely unwelcome to the United Automobile Workers Union, which has been seeking to raise the rates in the manufacturing shops, wherein most of its members are to be found, to a level equivalent with that of the job shops. And everyone on the labor side took vigorous exception to the fact that the act provided maximums, but no minimums.

The Society of Tool and Die Craftsmen predicted that "75,000 members" would go out on strike unless the rulings were rescinded. The UAW, saying that the STDC represented only about 1000 men in Detroit, took the more moderate course of denouncing the decision and petitioning for a new one by WLB.

The intermittent walkouts in the automotive plants were brought to

somewhat of a minor climax in mid-December when wildcat strikes halted work at a Bohn Aluminum & Brass Corp. plant for the third time in four days. The management figuratively threw up its hands after the third walkout, announcing that if the men did not come back to work—and stay on the job—they would close down the plant. Army Air Force officials moved in, settled the strike, and then indicated that the ringleaders of the walkouts were being thoroughly investigated.

AS in other such cases, the central labor body involved, this time the CIO-UAW, disclaimed responsibility for the tie-ups and urged the men to return to work. But whether with central office blessing or not, such tie-ups have been on the increase, and they should halt.

As if in answer to that increasing sentiment, the War Labor Board made a "unique" move at Washington. It awarded a maintenance membership clause to the UAW at the Yellow Truck & Coach Mfg. Co., but only on condition that wildcat strikes cease, and that if they do break out the ringleaders be punished by the international.

This is the kind of thing which companies have been rightfully seeking and it betokens, as the board's public member, Wayne L. Morse, stated, that "the patience of the public has its limits."

As a significant reflection of the current thinking in the War Labor Board, Mr. Morse's statement should be quoted more fully.

"Granted that the stoppages may have been the product of tempers, lapses of good judgment, real or fancied provocation, the fact remains that they did constitute violations of labor's solemn pledge that for the duration of the war labor should not resort to strike methods. Labor should not be blind to the fact that the patience of the public has its limits."

If this is in fact a change in the basic thinking on the part of public members, it may have wide ramifications, for previous decisions have well established that the public members represent a most effectual balance of power. Industrial management circles logically feel that if the public members swing around toward their way of thinking, the drift toward union security contracts, and toward a more substantial organized

To prove parts right or wrong . . . quickly

the Electrolimit Gage



HE IS using a master disk to set his gage . . . a matter of only a minute or two . . . and he'll be ready to check parts precisely to "tenths." Pieces will flow through inspection *rapidly*, with a minimum of eyestrain or fatigue . . . with *no* "operator variation," *no* element of human error. Frequently women do it better than men.

For this is a P&W Electrolimit Gage — one of many Pratt & Whitney products that provide *basic accuracy for mass production*. By mechanical-electrical magnification, this type of P&W gage may enlarge an error as much as 20,000 times. In various forms, it checks internally or externally, one dimension or several simultaneously. In one of its forms, it grades parts in increments of .0005" for selective assembly. It is unusually versatile . . . will serve its owner well in war or peace.

If you need basic accuracy for mass production, call on Pratt & Whitney. There is no better paying investment than the right tools for each job. Details of P&W Electrolimit Gages will be supplied on request.



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hold by labor on broad issues of employment will be weakened.

There is no doubt but what Washington is doing a great deal of thinking about the Detroit labor question, both in civilian and military circles. There is general recognition that the labor problems of the erstwhile motor city are tangled. What moves will be made to unravel the situation and turn it into a more orderly, logical and productive pattern are as yet undetermined, but action of some sort—more likely indirect than direct—is likely.

SOME belief exists that if there were more actual war consciousness in Detroit, wildcat strikes and other manifestations of unconcern for the course of arms production would lessen.

War consciousness does not seem to be stirred up as it might be by the drift of worker manpower to the draft.

Detroit plants are being importantly drained of their workers as is shown in a survey made among larger plants in the area early this month.

General Motors Corp. has thus far lost about 32,800 men to the armed services, and more are being drafted at about the rate of 4000 a month. Ford Motor Co. had lost 15,102 as of the date of compilation, and Charles E. Sorenson, manufacturing manager, stated that losses to the armed services are almost balancing new hiring daily at the Willow Run bomber plant.

Chrysler Corp. has 9,300 employees already in the armed services. Packard Motor Car Co. has contributed 2700; Hudson, 1487; Continental Motors, 752; Timken-Detroit Axles, 1223, and Ex-Cell-O Corp., 1154.

Labor, meanwhile, is enjoying a white Christmas tinged with the green of banknotes. Estimates indicate that close to \$20,000,000 bonuses is being paid this year to about 225,000 automobile workers in Detroit.

Nearly half of this comes from Ford Motor Co., where the union figures that bonus payments to employees amount to about \$9,000,000. There was some question, however, whether the payments of this bonus payment could be arranged before Christmas.

Chrysler Corp. paid approximately \$4,000,000 in bonuses on Dec. 16, in lieu of vacations for the year. Bonuses varied from one standard week's compensation to two, depending upon tenure of service.

General Motors Plants are paying bonuses, approximately \$2,-

Trend of the Times

• • • The "United Automobile Worker," tabloid newspaper of the union of that name has blossomed out with a women's page, in deference to the increasing numbers of women working in plants.

"In order to make the women's page most helpful" says the paper, "we urged UAW-CIO home makers to send to us their favorite recipes, household hints and their own discoveries of methods to make the home run more smoothly and efficiently."

The first such page, appearing in the Dec. 15 issue, includes a Christmas day menu, a list of books for children, details of a labor board election among the nurses of Hudson Motor Co., and other features of interest to women.

500,000 of which went to employees in the Detroit area.

Briggs bonuses amounted to more than \$1,000,000, and several others of substantial size were paid out by other factories.

On the subject of labor, the position of the United States Employment Service in the manpower stabilization program set up in Detroit ("The Assembly Line, Dec. 17) is no enviable one. Under the Manning Table program, USES will be an authority in the moving of men from job to job, in addition to its duties as arbiter of voluntary moves. If the history of the recent past is any criterion, there are stormy problems ahead.

The staff master mechanic of one of the largest war producers in Detroit was recently subjected to a series of requests from USES that he come down and talk to them. Telephone conversation finally ensued in which it developed that USES, noting that his occupational questionnaire had indicated experience in tool making, wanted him to transfer his occupation to a tool

making job. The USES was most insistent in its requests, which ended only when their subject finally told them in no uncertain terms what he thought of the whole idea, flatly refused to talk any more about it, and hung up.

Another similar case concerns an expert tool maker who was summoned to USES and found he was slated to go to Willow Run as a carpenter, inasmuch as he had had carpentering experience and Willow Run needed carpenters. Pressure from USES in this case was straightened out only after an employer's group intervened.

A third example is told of a welding shop owner who had checked his occupational blank with various other jobs with which he was familiar. One of these appeared to be in greater scarcity than his shop work, and USES wished him to transfer. But the discussion failed to achieve the USES aim.

Finally, very gravely, the shop man inquired whether it would relieve matters if he simply erased the checkmark he had made in the square opposite the more critical occupation. His interviewer, discouraged by the fruitlessness of his arguments, decided that would be the simplest way out of it. An eraser was procured, the check mark erased, and the file in this case is now closed.

Studebaker Reports On War Production

Southbend, Ind.

• • • Studebaker Corp.'s Wright Cyclone aircraft engine contracts have been enlarged to the point that output during forthcoming months will exceed current rates by a very considerable margin. Equipment orders for this new business have all been placed, and deliveries are now being received. Newsmen visiting the Studebaker plant at Southbend were told Monday that operations have been on schedule since June. In all, the company has 10 separate contracts, of which commitments for aircraft engines and trucks are the only ones made public. As a result of these orders, Studebaker's shipments this year will approximate \$215,000,000, or about \$100,000,000 more than last year.

4 TIMELY HELPS

for Your ALL-OUT Production Program

to help you select the right tool steel for each tool



Here is a quick reference manual for the tool engineer and tool designer. "The Carpenter Matched Tool Steel Manual" provides an 80-page Tool Steel Selector alphabetically indexed by kinds of tools. Flip the pages and it guides you to the steel that best meets the requirements for each tool.

Also contains accurate and complete heat treating instructions on each of the Carpenter Matched Tool Steels. It can help you save time and materials—and get the most out of every pound of tool steel.

how to check the identity of tool steel



For quick identification of mixed stock... for checking identity of the steel before heat treating tools... here is a ready reference guide for training men in spark testing. This wall chart (21" x 30") clearly identifies the spark of each of the Carpenter Matched Tool Steels. It provides information

on spark characteristics caused by the major alloys. With it as a guide, men can be trained to quickly identify different types of tool steels.

how to get the most out of this oil-hardening tool steel



If you are interested in knowing about *Stentor* Oil-Hardening Tool Steel that is saving time and helping to avoid trouble in many tool rooms, write for our bulletin, "How to Get the Most Out of *Stentor* Oil-Hardening Tool Steel". It contains simple heat treating instructions which save experimenting by clearly defining hardening procedure for best results.

Also has information on safety in hardening, holding size, hardening without soft skin, and detailed data on *Stentor*—the old standby that is insuring better tool performance wherever it is in use.

to help you speed up training of tool and die makers



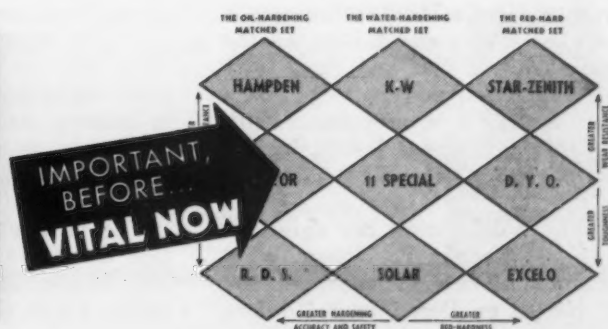
Training skilled labor in the shortest possible time is just about the "number one" problem facing war industry today. Here is the handbook around which many plants have built their training programs. Every man you want to train for your tool room can get practical knowledge from it. It is written in simple language, free from technical terms. Covers tool

design, heat treating, quenching, testing, analysis, trouble shooting, etc. 315 pages, 205 illustrations. Available at cost—\$1.00 per copy in the U. S.—\$3.50 elsewhere. Order as many as you need today.

This useful tool steel information can help you solve your war production problems. We will be glad to send you copies of any or all that you desire. Write us today on your company letterhead. The handbook, "Tool Steel Simplified," is available in any quantity in the U. S. A. at cost—\$1.00 a copy (\$3.50 elsewhere). The other literature is free to tool steel users in the U. S. A.

THE CARPENTER STEEL COMPANY, 121 BERN STREET, READING, PA.

Carpenter
MATCHED
TOOL STEELS



Washington . . .

• Patterson holds that giving war production direction to civilian agency might lose war, says armed forces have done outstanding production job . . . Nelson has put full production authority in C. E. Wilson's hands.



WASHINGTON — Denying that the military seeks control of the civilian economy and the country's industry, Undersecretary of War Robert P. Patterson told the Senate Truman Committee Investigating National Defense Expenditures on Dec. 16 that a change in the direction of war production and procurement from the War Department to any civilian agency would be, if done now, "disastrous, and might cause the loss of the war."

Mr. Patterson said that the accomplishment of this change by legislative or other means was being proposed. Spokesmen for the War Department declared that this expression referred to the identical bills introduced in the House and Senate by Congressman Tolan of California and Senators Kilgore and Pepper of West Virginia and Florida, respectively.

This same spokesman said that while the Undersecretary referred also to the possibility of the issuance of an executive order pursuant to the First War Powers Act, but expressed belief that there was a working arrangement between the Secretaries of War and Navy as to the production powers to be exercised by WPB in accordance with the joint statement issued by the secretaries and the WPB chairman on Dec. 4.

But, in delegating the agreed-to duties of Charles E. Wilson, WPB Production vice-chairman, Donald M. Nelson on Dec. 9 issued orders

which placed both full war procurement and production authority in Mr. Wilson's hands.

THE War Department official declined to say anything beyond what Mr. Patterson had testified to before the Truman Committee. He said he had seen but had not studied Mr. Wilson's orders and refused to say whether he thought they removed control over production and procurement from the War Department.

Varied reactions to Mr. Patterson's statement were expressed at WPB. By some it was taken as a direct challenge to the directive orders issued by Mr. Nelson under authority given to him by the President in the original executive order setting up WPB. In that order WPB was granted jurisdiction over all war agencies in the matters of materials, procurement and production. In March Mr. Nelson redelegated this authority to the War and Navy Departments.

Some credence must be given to the belief that the Undersecretary's words were a challenge. For this statement said in part: "For maximum effectiveness the stages of production must be under direction of the same agency as to each type of weapon. Experience has shown that where successive stages of production are under control of separate agencies the results are not the best. It does not work well to place procurement in one agency and follow-up of production in another agency. The operation is a single continuous one. Duality of control will not work."

On the other hand, according to the order, Mr. Wilson as Production Vice Chairman by and with the advice and assistance of the Production Directive Committee, has been made responsible for and is to direct the scheduling of the various production programs of the Army, Navy and Maritime Commission and other agencies. Mr. Wilson's duty is to insure that program schedules do not conflict, are in balance, are consistent with production possibilities and are in accord with the strategic requirements of the Chiefs of Staff.

The membership of the Production Executive Committee of which Mr. Wilson is chairman will include: Lieut. Gen. Brehon B. Som-

ervell; Vice Admiral S. M. Robinson; Maj. Gen. Oliver P. Echolls; Rear Admiral R. A. Davison; Rear Admiral Howard L. Vickery and Ferdinand Eberstadt, WPB Program vice chairman.

Mr. Patterson argued against the transfer of control setting up five points as follows:

1. The transfer from the Armed Services would result in taking the work out of experienced hands and putting it into inexperienced hands.

2. Even if such a transfer were theoretically advisable and could be planned in time of peace, a change would be disastrous now. The destruction of a going organization in favor of one untried and inexperienced might result in the loss of the war.

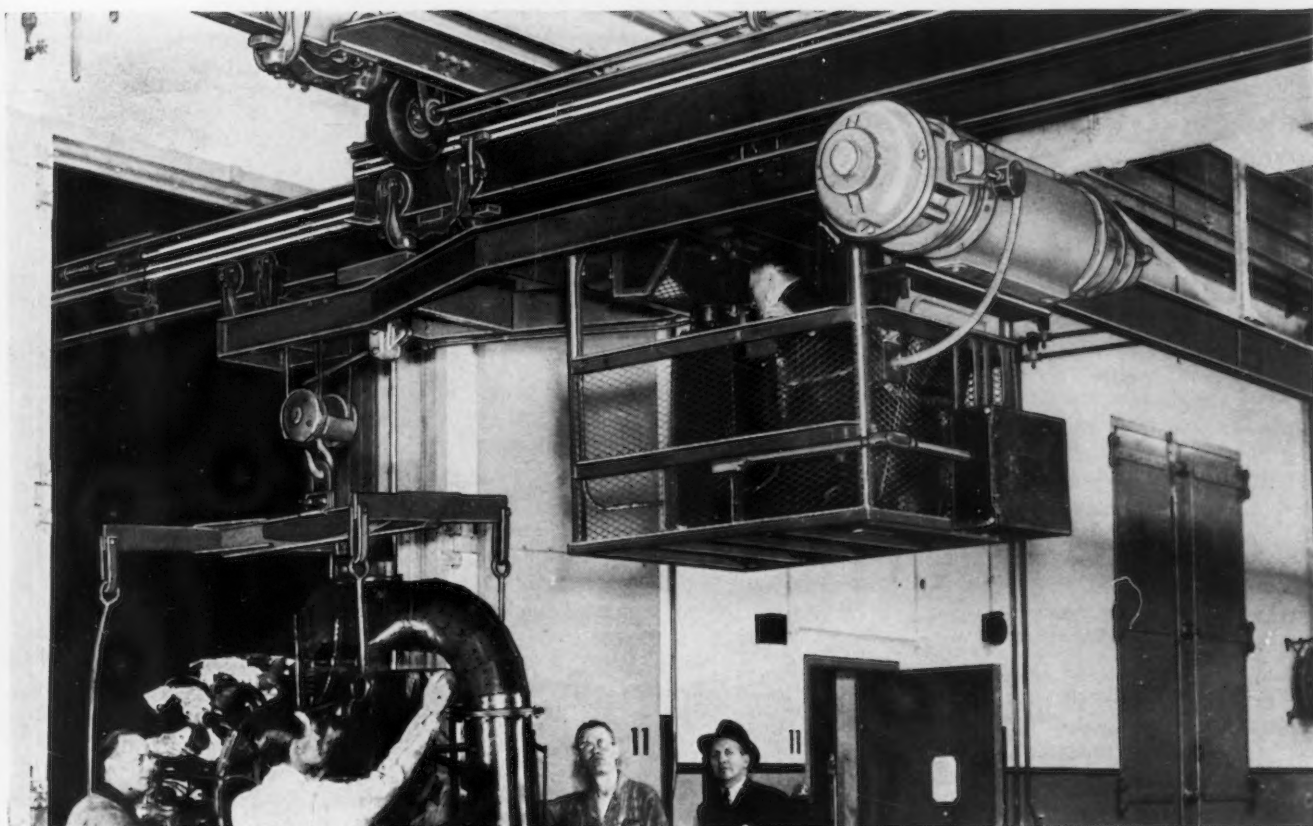
3. The proposed change would most surely result in the production of inferior weapons. The Armed Forces are aware of the needs of the troops who use the weapons in fighting. If production of weapons were turned over to an outside agency, the control of such production would be further removed from the men who use the weapons. Time in making necessary changes would inevitably be wasted.

4. It is said that the Armed Services should say what they want and when they want it and that another agency should attend to production of weapons. It would result in a division of responsibility in a field where single responsibility is of prime importance. The steps involved in production of weapons for war, from design through to inspection, delivery and field maintenance, represent a continuous flow and should be under single control. There would be constant collision between those stating the needs and those charged with supplying them.

5. The Armed Forces have done an outstanding job on production of munitions. When a job is being done well, there is no cause for turning it over to someone else.

IT is therefore apparent, unless some contrary indication is given by Mr. Patterson, that the joint statement setting forth the agreement between the Secretaries of War and Navy and the WPB Chairman that the War Department now only agrees that Mr.

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Wilson should have full charge of "central supervision and direction of the programs of aircraft, radio and detection equipment and escort vessels." The statement, however, said that Mr. Wilson is to "exercise general supervision of the scheduling of the programs between the various services to see that they do not conflict and that they are of such a nature that they may be performed in accordance with the requirements of the Joint Chiefs of Staff and of the total war program."

Undersecretary Patterson made clear his ideas of the functions of the civilian agencies. He said they were to provide an increased supply of critical materials, the facilities for the production of semi-finished products required for military end items, and administrative control of the flow of materials and the elimination of these materials for non-essential purposes. He added that they can be of assistance to the services in other ways as well.

"They are also charged with the duty of continuing civilian supply necessary to support the war effort," he declared. Mr. Patterson asserted that among the duties of such agencies are priority and price control, allocation of facilities,

control of raw materials and other commodities, control of labor supply, power and fuel, transportation, finance and foreign trade.

BUT Mr. Nelson in his orders gave Mr. Wilson and the WPB power to secure schedules, records and information in the form and at the time designated; to inquire into any feature of war production or procurement programs, including its scheduling and the scheduling of components and to have access to such records of the war agencies as relate to war production.

In the order that establishes Mr. Wilson's sphere, he is permitted to consult freely with the heads of war agencies or with their subordinates and also he may consult freely with any supplier of war products or components of war products. At the same time, Mr. Wilson is charged with the preparation and maintenance of the program or any of its parts.

WPB officials close to Mr. Nelson feel that he has taken this action to carry out the duties imposed upon his agency by the President's order. If he fails to do this, it is contended, WPB may as well fold up. Developments will show whether WPB is to continue in its

present form. Mr. Nelson's entire career may rest upon the decision which most people concede must be made by the President.

THE orders issued establish relationships between Mr. Eberstadt, Program Vice Chairman, and the Office of the Production Vice Chairman.

Whenever additions to or changes in military programs make necessary adjustment in previously authorized programs, Mr. Wilson shall adjust schedules, in accord with strategic requirements of the Chiefs of Staff. In the order which shows the relationship between the Production vice chairman and the Program vice chairman, Mr. Eberstadt, Mr. Wilson is to seek Mr. Eberstadt's advice wherever proposed plans or programs or schedules are likely to exceed production capacity because of "material shortage," and on readjustments which might effectively meet the material limitation.

In the allotment of materials, Mr. Wilson shall arrange with the Army, Navy and Maritime Commission for the establishment of procedures to assure that schedules and claims for materials submitted to Mr. Eberstadt are in harmony with plans, programs and schedules approved or released by Mr. Wilson. The Program Bureau and the Controlled Materials Divisions under Mr. Eberstadt are to determine the consistency of the allotment requests made by the Armed Services and others submitted to themselves and the Requirements Committee with the production schedules approved by Mr. Wilson and with material supply. Whenever determinations by Mr. Eberstadt covering the distribution of materials among claimant agencies are made, Mr. Wilson is to adjust schedules in accordance with the determinations.

Mr. Wilson, who is president of the General Electric Co. and an acknowledged production authority, has been given complete responsibility for aircraft production in an order which parallels the one granting him general power. He is to be advised and assisted by the Aircraft Production Board of which he is chairman. Its other members are: Lieut. Gen. William S. Knudsen of the Army; Maj. Gen. Oliver P. Echols of the Army Air Forces; Rear Admiral R. A. Davidson, and T. P. Wright of WPB.

THE BULL OF THE WOODS

BY J. R. WILLIAMS



How TO ORDER GAGES

When an order for fixed size gages fails to include complete gage specifications, the missing information must be gotten by further correspondence before the order can be put in production. This delays procurement of these vital tools and it also puts an extra burden on the time of procurement personnel. Both can be prevented by including all the following information on gage orders.

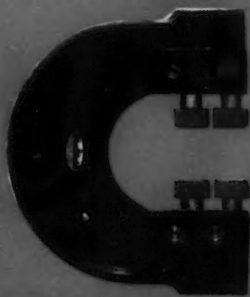
PLAIN PLUGS and RINGS



- 1 Size (Go and Not Go).
- 2 Class of gage makers' tolerance.
- 3 Members desired—Go, Not Go, Handle.
- 4 Length of member—standard or extra long.
- 5 If progressive member is wanted, so state.
- 6 Complete marking instructions.



SNAP GAGES



- 1 Frame size.
- 2 Frame model.
- 3 Range.
- 4 Stipulate whether gage is to be set and sealed.
- 5 Complete marking instructions.

THREAD GAGES



- 1 Size (Go and Not Go).
- 2 Threads per inch.
- 3 Class of fit for the work part.
- 4 Class of gage makers' tolerance and pitch diameter.
- 5 Members wanted—Go, Not Go, Handle.
- 6 Complete marking information.
- 7 Whether or not a setting plug is to accompany a ring gage.
- 8 If setting plug is ordered, whether ring gage is to be set and sealed.



It is always strongly recommended and good practice to order a setting plug for every thread ring gage purchased because there is no other good way of accurately checking ring gage wear or of resetting the ring gage to compensate for that wear.

The gage maker does not set and seal a thread ring gage unless he also furnishes a setting plug. He cannot do this because of the three variables involved, pitch diameter, lead, and thread angle. Every one of these is interrelated and every one may vary within its own tolerance zone. Thus, a thread plug and a thread ring made at different times or by different manufacturers may both be well within their tolerance limits in every element and still, because of these small cumulative differences, the two might not fit together precisely. When both the ring and the setting plug are made together, these differences can be adjusted, but not otherwise.



THE *SHEFFIELD*

C O R P O R A T I O N

DAYTON, OHIO, U. S. A.

WEST COAST . . .

• Optimistic now about the course of the war, Pacific Coast speculates over its industrial future . . . Some persons suggest lower freight rates, subsidies and other assistance should be assured now.



SAN FRANCISCO—Proof that the West Coast, which sees face to face more than its share of war activities, is not downhearted about the course of the war, is indicated in the sudden revival of speculation regarding the industrial fate of this section when victory finally is won.

Such speculation for the past year has been considered to be in the same category of bad taste as shooting spit balls in church, and possibly its current revival is merely an indication that the ebullience of industrial soothsayers here is on a par with spit ball shooting small boys who cannot resist temptation. From a general morale standpoint, this is bad, for it not only distracts attention from the messy business of winning the war, but it inevitably calls to public attention the possibility that mere abdominal gas may follow the present orgy of gobbling up war contracts. Like the man who prudently downs a couple of seltzer tablets before retiring after an evening of heavy dining and wining, some of the forward lookers already are suggesting that lowered freight rates, government subsidies, and a Federal guarantee of future economic security should be assured now if this presently bloated economy is not to result in a bad case of morning-after. Despite the loud fizzing sound from private enterprise as these government seltzer tablets dissolve, they have been taken in the past with admirable

success in curing such head colds as the late lamented depression.

In the construction of facilities, training of manpower, and development of technique, the fact that Coast yards delivered 48 of the 84 ships completed for the Maritime Commission in November, and a corresponding proportion in other months, is due in large part to the fact that the Commission granted the Pacific yards a tidy differential in their bids on vessels before the war. That these same differentials will continue after the war as the Commission rounds out its long range program of 500 standard vessels in ten years is taken for granted. Even with this differential, though, the long range program would not go far toward keeping the industry here operating on its present scale, either in number of yards or in number of employees.

LOOK at the November figures again: Of the 48 Maritime Commission ships delivered, 45 were emergency cargo vessels of "Liberty" design; the other three were standard vessels under the long range program, one a C-3 and one a C-2. Of the eight yards which participated in these deliveries, only three were participants in the long range program, and the other five were built specifically with a mass-production eye on either Liberty ships or their British predecessors. The same ratio holds approximately among the other eleven Coast yards working on Maritime Commission contracts. If the shipbuilding industry on this Coast, which constitutes the bulk of the current steel market here and serves as the best excuse for erecting the substantial new far western integrated steel capacity, is to survive, more than a slight bidding differential on a normal Maritime Commission building program is needed. Instead of 500 ships in ten years for the entire nation, the Commission would have to think about building 600 ships a year on the Coast alone. Even reduced to a sane basis, the implications of the scale of Federal subsidy which would be necessary to salvage this one segment of western war industry are strictly stupendous, to borrow a phrase from Hollywood.

The dark clouds that threaten to burst upon the aircraft industry, which constitutes the second major segment of wartime economy here, were discussed in last week's "West Coast" column as fully as wartime weather reporting restrictions allow.

The third big segment of today's boom, like shipbuilding but unlike aircraft, has a background of out-and-out government subsidy or reasonable facsimile of the same, for this particular section of the country. That is the slice of the industrial pie which has its basis in the tremendous hydro-electric power projects which have so conveniently fitted into the wartime need for vastly expanded aluminum and other electro-metallurgical production. Although these projects were planned with one eye cocked on irrigation and reclamation as a basis for small subsistence farms, and the other eye on a diversified industrial development, they have been just what the doctor ordered to provide emergency power for a handful of big aluminum and magnesium plants, with enough left over for other industry. To the surprise of everyone familiar with the tendency of government power promoters to take credit for their customers' achievements, real or imagined, none of them has yet crowed that "we planned it that way."

INSTEAD, the Bonneville Administration, which runs both Bonneville and Grand Coulee dams and distribution systems, has continued unabated its study of possible home town industry in the smaller Pacific northwest communities and has been one of the chief Jeremiahs concerning the probable future of the centralized metal industry which now constitutes its best customers—unless something is done about it. Bonneville boosters, like those in southern California, realize that peppering the countryside with raw aluminum plants holds little hope for a sound industry unless rolling mills and other finishing facilities can be built nearby to balance off the production picture. These Bonneville enthusiasts got one jump up on the Californians when they cadged an aluminum

A LESSON IN

Dynamics

The mahout who first trained his elephant to pick up and transport logs, knew a good thing when he saw it. He recognized that the beast possessed not only power to do the job, but also the means of applying that power effectively.

Generations of log-lifting elephants came and went before machines were devised to match the economical, smooth and versatile ability of these animals to lift and move heavy objects. The long wait ensued because satisfactory means of applying power were not developed until long after the power itself — engines to equal that of many elephants — had become an accomplished fact.

Finding and developing better ways of transmitting, applying and controlling industrial power *through clutches* is the activity to which the Twin Disc Clutch Company has confined itself for the past 24 years. Like the mahout, industry was quick to recognize a good thing when it saw one. Widespread application of Twin Disc products confirms the success of our company's policy of concentration — of doing one thing superlatively well. Builders and users of every type of power-driven machines and equipment have learned that the name Twin Disc means better clutches at lower cost.

Our facilities for research and the counsel of our engineers are at the disposal of clutch users who are planning for the days to come. You can put our specialized knowledge of friction clutches and hydraulic drives to work for you today, to solve tomorrow's problems. TWIN DISC CLUTCH COMPANY, Racine, Wisc.

The Twin Disc Hydraulic Torque Converter* (Lysholm-Smith type) gives to modern log loaders, smooth and flexible operation which greatly reduces loading costs, holds maintenance to a minimum and makes equipment last much longer.



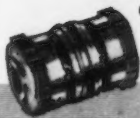
Clutch
Power Take-off



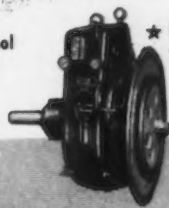
Tractor
Clutch



Heavy Duty
Clutch



Machine Tool
Clutch



★ Hydraulic
Torque Converter



Marine
Gear

rolling mill for eastern Washington which the southerners thought was in their grasp prior to Pearl Harbor, but this by no means balances the excess facilities for raw metal production provided by five plants in the area, slated to use about 600,000 kilowatts of power annually. Rabid westerners like to think that the East is perpetrating some sinister plot in making it necessary to haul ore thousands of miles to the far West for reduction, then transporting ingots east for rolling, and bringing aluminum sheets back to the Coast aircraft factories again. Indeed there is no end to the Congressional investigations which this situation may some day inspire. The fact remains that the Coast aluminum industry is little more than half an industry.

Glenn H. Bell, manager of the Bonneville's Upper Columbia district, says that "after surveying the prospects with some care, we believe that with proper effort, eastern Washington aluminum and magnesium production will find its markets in the entire West, and may be able to compete with Eastern Seaboard production in an area ranging as far east as the prairie states of Nebraska, Kansas and the Dakotas.

"In a large part of that territory it should be possible for eastern Washington to achieve a level of freight costs for its products which will be on a parity with freight costs of similar light metal products made in North Carolina, Tennessee, and New York. I believe that if we are to develop our light metal industry we must be prepared to fight for freight rates on our new products that will permit the industry to thrive, and I can tell you that Bonneville will be on the firing line to help."

AS a post war aluminum market, Nebraska, Kansas and the Dakotas do not constitute a particularly inspiring prospect, however, and it is realized that unless greater self-sufficiency can be realized either through utilization of native alumina clays, or new expansion of metal finishing facilities, or both, the Northwest reduction plants are likely to be very dead dogs come the armistice.

As a basis of its long range program, Bonneville has never given

up the hope of a fully integrated local steel industry, based either on electric smelting or blast furnace reduction of local ores. Some progress toward this end has been made through Defense Plant Corp. sponsorship of local metallurgical coke production from Washington coal, a project formerly viewed with considerable skepticism.

In the course of a back-slapping tour by Paul C. Cabot, deputy director of the WPB Conservation Division, shipments of scrap steel from the West Coast to the Chicago district, discussed at some length in previous issues of THE IRON AGE, were confirmed, and plans for additional shipments made known. The quantity of high grade material shipped during November amounted to 12,000 tons, and 35,000 tons more will be immediately purchased by Metals Reserve Corp. from Coast scrap yards and shipped East at Federal expense. Of this 35,000 tons, shipments of 10,000 tons are presently authorized from a single southern California dealer. The total represents approximately one month's

excess of present supply over demand on the Coast.

As has been the case in other inter-shipments, underground reports indicate Coast scrap processors are apprehensive of this forced movement of prepared scrap from the Coast, although their position in the transaction precludes public complaint. The objection is not on the basis of possible immediate shortage for Coast mills, for stocks now average from 60 to 90 days' requirements, and more unprepared material is coming in, but is predicated on the severe labor shortage faced by the scrap yards and their extremely limited processing capacity. It is no great problem to feed the four northern California scrap presses or the limited number of southern California or Pacific Northwest presses, but this pitifully small number constitutes a real bottle-neck in preparing sufficient quantities of scrap for Coast mills. On the other hand, the economic disadvantage of hauling unprepared scrap, from the standpoint of railroad car utilization, is recognized.

General Electric Plans Films On Atomic Hydrogen Welding *Hollywood, Cal.*

• • • Joe McGee, the Welder, the saucy cartoon personality who was introduced last summer in General Electric's industrial training films, "The Inside of Arc Welding," will play a return engagement in the spring in a new series of training motion pictures on welding, "The Inside of Atomic Hydrogen Welding," which is now in preparation at the Raphael G. Wolff Studios in Hollywood under General Electric sponsorship.

The new training program is being produced by the same studio which produced "The Inside of Arc Welding," in 16-mm. Kodachrome, and will employ photographic, animated diagram and cartoon techniques.

"The Inside of Arc Welding" has, to date, been actively used in the training programs of more than 2000 war production plants and army and navy depots and has been widely praised for its effectiveness in presenting the subject. "The Inside of Atomic Hydrogen Welding," it is expected,

will be available for manufacturing plants, schools and other training centers about March 15.

Pacific Coast Conference Divided Into Two Sessions

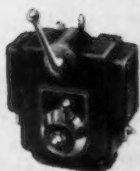
• • • Due to war production pressures, limitation of transportation and complete absorption of facilities at the Hotel Del Monte for military purposes the nineteenth annual Pacific Coast Iron, Steel and Allied Industries Conference in February has been divided for 1943 into two area conferences, each for a single day. At Hotel Biltmore, Los Angeles, on Feb. 17, members of the industry in the Pacific Southwest will meet for luncheon and the afternoon with a principal speaker and two panel discussion leaders. In San Francisco on Feb. 24 at Hotel St. Francis the same type of meeting will be held. Howard M. Taylor, Taylor & Spottswood Co., San Francisco, is chairman, Samuel E. Gates, General Electric Co., is vice-chairman and Charles S. Knight, director industrial department, California State Chamber of Commerce, is secretary.

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Units for Every Hydraulic
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FLUID MOTORS



VARIABLE DELIVERY PUMPS



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VOLUME
CONTROLS

Accident rates increase in times like these when unskilled workers must be hired to operate production machines. Machines equipped with Vickers Hydromotive Controls help to keep down accident rates.

Vickers Hydromotive Controls are simple, easily mastered and offer less opportunity for accident-producing mistakes. Completely automatic cycles are easily set up. Overload protection is positive and automatic. Controls may be so interlocked that incorrect operation sequence is impossible. Vickers Controls can be operated with one finger and can be placed wherever most convenient for the operator. As a result, the operator is not subjected to nervous or muscular strain.

All of these factors tend to reduce accident rates, increase production, reduce work spoilage, eliminate damage to machines. Vickers Application Engineers will gladly consult with you on specific machine requirements.

VICKERS Incorporated

1420 OAKMAN BLVD., DETROIT, MICHIGAN

Fatigue Cracks

BY A. H. DIX

Fundamental Heat Treatment

Please advise method of stress relieving to keep (price) ceilings from cracking. Where is heat to be applied?

—A. E. Henderson, Master Mechanic,
Brown Paper Mill Co., Monroe, La.

A start might be made by applying a blow torch to the seats of the pants of certain Senators and Congressmen.

Partial Patriots

• • • Gripes about rationing indicate that many of us are willing to make any sacrifice demanded by the war provided we aren't inconvenienced.

The Generous Mr. Moore

• • • A man whose acquaintance we yearn to cultivate is "A. Moore," a particularly successful impostor who is offering subscriptions for your favorite family journal at fancy rates. His usual offer is three years for \$20, but if pressed he will be more generous, having nothing to lose.

The receipt he tenders bears the name of the Publishers Service Bureau, 428 Fifth Ave., New York, a figment of his fertile imagination. Subscription impostors usually change their names from town to town, but "A. Moore," whose real name is A. Yerden, is different. He was "A. Moore" in Cleveland and nearby cities, and he is "A. Moore" in western New York State. A man has his pride.

Endorsements on the checks given him indicate that he is a drinking man, and detective work on the part of two members of our Ohio staff reveals that any money you might pay him will probably end up in the handbag of a night club hostess.

"A. Moore" is about 52, polite and persuasive, about 5 ft. 10 in. tall, and weighs in the neighborhood of 155 lb. If he should call on you will you wire the Reader Service Department collect, or, better still, telephone Murray Hill 5-8600 (New York), reversing the charges.

Blurb

• • • One of the gentleman's victims flatters us by asking, "How did he know we were a subscriber? He must have access to your subscription list." The fact is, of course, that practically everybody who is anybody in the industry takes your favorite family journal. All Mr. Moore needs is a classified telephone directory.

Women in Masks

Doesn't "weldist" seem too masculine for lady welders? Why not "weldstress," following the well-known seamstress and mistress precedent?

—Osgood Murdock

If broken in the middle "weldstress" has an unhappy connotation. "Weldress" is far better, but it wouldn't stick, for *chairwoman* is no more, and *authoress* and *poetess* have barely enough breath left in them to dim a mirror.

Now that the initial shock has passed "weldist" seems almost tolerable.

Roman Rave

• • • While poking oakum into chinks in our cellar window frames last Sunday morning, we decided to exercise our rights as a member of a democracy and at the same time broaden our viewpoint by listening to an Axis broadcast. A gentleman with a 110-proof Oxford accent, speaking from Rome, was being fretful toward Winston Churchill. And then, although the reason for the transition was not made plain, he trained his short waves on advertising. It is, he said, a tool of monopoly.

To us advertising is a cosmic force, and needs defense about as much as do the law of gravitation and the biological urge. Like everything else, with the exception

of Fred Astaire's footwork, it has its faults, but the fostering of monopolies is not among them.

Instead, the opposite is true, as is obvious to anyone whose memory encompasses even a single decade in the history of candy bars, cleaning compounds, and dictatorships. If there were no advertising the topdog in any market could continue to sit pretty for an indefinite period, for there would then be no means for the public to be acquainted quickly and economically with the merits of a superior product.

The Rome broadcaster's boss, Mr. Five-by-Five, is well aware of this. The first thing he did when he took over was to discourage the favorable mention of systems competing with his own. Therefore, we find the Rome broadcaster guilty of either superficial thinking or sophistry, and hereafter we will confine our listening to Major Bowes, the Rise of the Goldbergs, Gabriel Heatter, Amos and Andy, and other programs dispensing nothing but truth in all its purity.

Apitronym

Edward Coffey is chief rationing attorney for the New York district OPA office.

—W.A.L.

Orchid

• • • We are not deaf to what Xenophon, as we see from Mencken's "A New Dictionary of Quotations," lent to us by Miss Jane Butzner of the brains department, says is the sweetest of all sounds—praise. But neither are we rendered ecstatic by a kind word, for your favorite family journal, which we shyly admit is the world's greatest industrial paper, is calloused from backpats.

However, occasionally we get a tribute that because of its spontaneity raises our pulse from ragged 80 to a strong 85. For example, we found this note pinned to a check that came in the other day from a little company in Girard, Kan.:

The attached check for \$8 is for a year's subscription to The Iron Age—a fine magazine. "Devil Take The Little Fellow" was good.

"Devil Take the Little Fellow" was the July 30 editorial and is one of the 30 gems from the Remington of our pres. and ed., John H. Van Deventer, in the booklet of editorials just off the press.

Stopper

• • • Bad News for Bloodthirsty Birds—Standard Tube Co.

Forecast

• • • We have "Galluped" the brains department and the consensus is that the Annual Number, which will be in your lap two weeks from today, will probably be the finest of the 4524 issues published by your favorite family journal during the past 87 years. As our editors are modest folk and always understate, you can begin slaverling now.

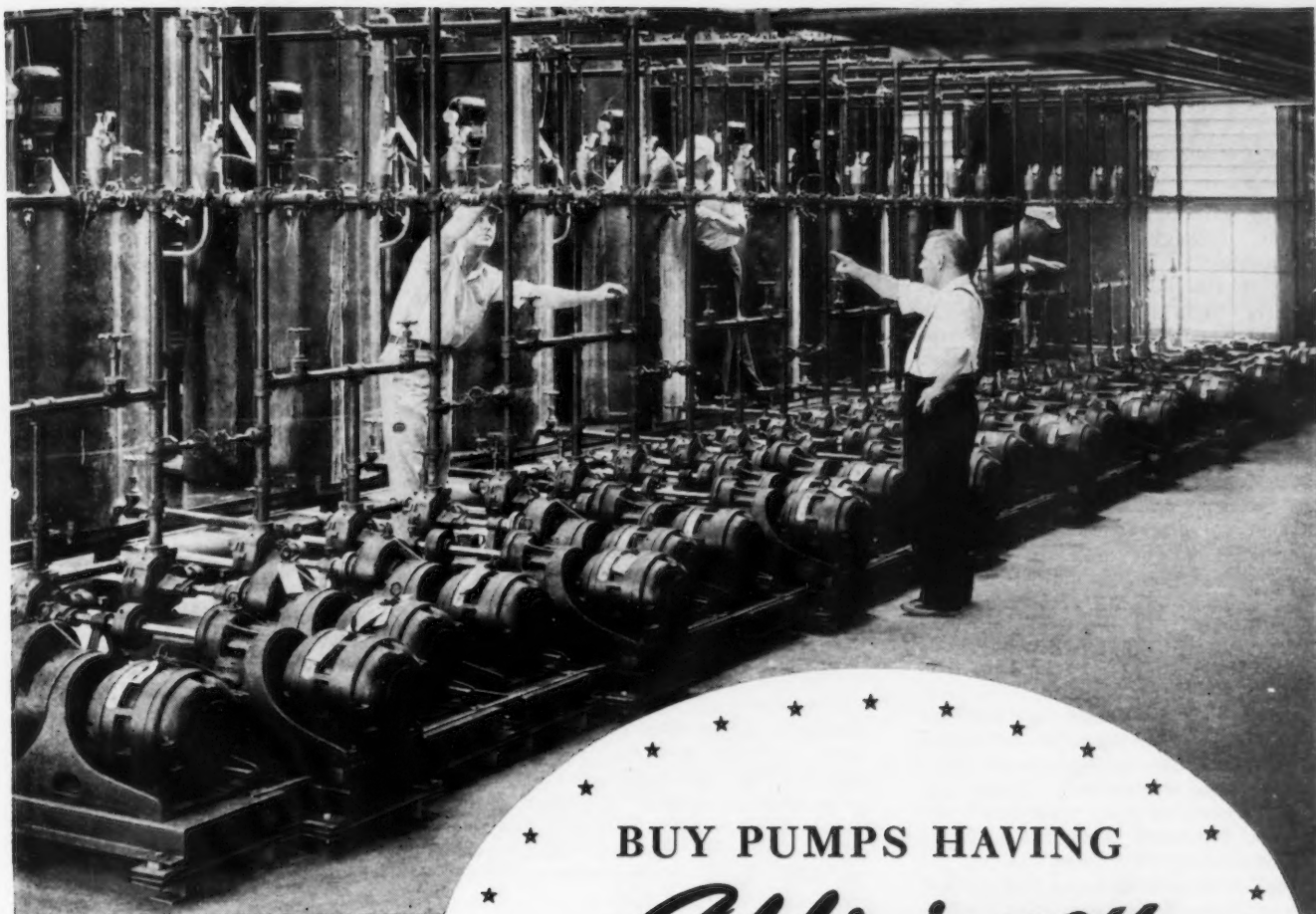
Puzzles

This issue went to press before we had an opportunity to hear from the master minds about last week's problem.

We are hard pressed for puzzles. This one, sent in by Lt. Com. A. R. Simpson, isn't new and isn't old enough to seem new, but we can't be fussy, as we are scraping the bottom of the barrel:

A man is usually met at the station by his wife at a certain time each evening and driven home. One day the man left his office an hour earlier than usual and arrived at his home station an hour earlier than he usually arrived there. His wife of course was not there to meet him, so he started walking home. His wife met him along the road as she was driving to meet the train he usually took, turned the car around immediately and they both arrived home 20 minutes earlier than usual. How long did the man walk before his wife met him?

To this page's loyal army of
18 readers, A Merry Christmas!



These 36 F-M motor-driven rotary pumps in a large manufacturer's paint mixing room serve distant paint spray booths.

BUY PUMPS HAVING

Efficiency

*That's More Than
Skin Deep!*

THOSE pumps you are about to buy for war production—will they serve you efficiently not only now but also through the years to come?

They will if you choose Fairbanks-Morse Pumps. For these pumps have mechanical superiority which per-

mits them to retain their efficiency long after less highly engineered pumps begin to waste power.

So use your priority to buy pumps for today with an eye for tomorrow. Fairbanks, Morse & Co., 600 South Michigan Ave., Chicago, Illinois.

FAIRBANKS-MORSE



**PUMPS
DIESELS
MOTORS
SCALES**

Dear Editor:

ROUGHENING FOR METALLIZING

Sir:

Your issue of Nov. 12 contained an article, "Roughening Surfaces for Metallizing." We have metallizing equipment in our shop and quite frequently are required to metallize crankshafts that are hardened and have been considering the installation of sand blast equipment for roughening the surface in preparation for metallizing.

We would like to have information as to the hardness of the steel that can be prepared in accordance with the article referred to. Also, if this same tool can be used for flat surfaces such as clutch plates, or if it is applicable only on cylindrical surfaces.

PAUL H. MAGNUS

Tranter Mfg. Co.,
Pittsburgh

• The method described in the article is applicable only to soft shafts and hence could not be used successfully on hardened crankshafts, unless the bearing surfaces were worn below the original hardened layer of metal. It is possible to turn steel up to 500 Brinell with carbide tools. The method generally used for preparing crankshafts for metallizing is either to grit-blast them, using a 30-40 metallic grit, or to blast them with some non-metallic abrasive material like Metcolite, a proprietary material made by the Metallizing Engineering Co., Inc., 2107-41st St., Long Island City, N. Y.

The roughening technique described in the Nov. 12 issue can be used for flat surfaces as well as cylindrical surfaces. But ductility of the material is a requisite.—Ed.

MUNITIONS MANUFACTURE

Sir:

Your Nov. 12 issue mentions, "Munitions and Ordnance Manufacture." Our Forge Shop engineer wishes to secure this publication, and if published by you, would be glad if you would mail us a copy.

T. B. RHODES,

Production Manager
Conley Frog & Switch Co.,
Memphis, Tenn.

• "How to Make Munition and Ordnance," 154-page book, is published by THE IRON AGE. Price is \$1.—Ed.

CUPOLA BRIQUETTES

Sir:

We are interested in obtaining two copies of the article, "Cupola Practices with Briquettes," as published in your Aug. 27 and Sept. 30 issues.

D. A. WILSON,
General Purchasing Agent
Canadian Westinghouse Co., Ltd.,
Hamilton, Canada

CHROMIZING

Sir:

Would it be possible to get tear sheets of the article on page 49 of the Nov. 26 issue, "Steel Chromizing?"

ELIZABETH P. HATCH,
Librarian

General Plate Division,
Metals & Controls Corp.,
Attleboro, Mass.

• Clippings have been mailed.—Ed.

FACTORY FORMS

Sir:

Who publishes the books containing factory forms and records? We desire something to apply to a small factory employing fewer than 100 production employees.

J. GERSTENFELD

Esmco Auto Products Corp.,
Brooklyn, N. Y.

• We know of no book consisting wholly of forms used in factory systems. In the past ten years, THE IRON AGE has published many articles on production control, inventory control, and other plant systems, and in practically every case has illustrated the forms used. We recommend that you consult bound volumes of THE IRON AGE in public libraries. Most books on the various phases of industrial management illustrate the forms employed. We suggest, "Plant Production Control," by C. A. Koepke, published by John Wiley & Sons, 440 Fourth Ave., New York, \$4; "Principles of Industrial Organization," Kimball, published by McGraw-Hill, 330 W. 42nd St., New York, \$4; "Factory Organization & Administration," Diemer, published by McGraw-Hill, \$4; and "Cost and Production Handbook," Alford, published by Ronald Press & Co., 15 E. 26th St., New York, price about \$10.—Ed.

ARC WELDING SPEED

Sir:

Will you please send two copies of the article, "How to Figure Arc Welding Speed," by H. O. Westendarp, Jr., published in your Sept. 24 issue.

P. F. BENDER,
Chief Estimator

Snead & Co.,
Jersey City, N. J.

METAL CLEANING

Sir:

Have you any publications or books on Metal Cleaning?

VINCENT CASSWELL

Forest Hills, L. I., N. Y.

• "Cleaning and Finishing Metal Products," reprinting articles in the series that has been running for the past several years in THE IRON AGE, is a cloth-bound book of 225 pages, price \$3.—Ed.

CUTTING TOOL LIFE

Sir:

Several weeks ago there was an article in one of the magazines to which we subscribe, supposedly IRON AGE, about a fine grinding or honing machine developed by Curtiss Wright Aeronautical Corp. for smooth sharpening metal cutting tools to increase tool life.

Will you please write us indicating the method involved, and, perhaps citing a manufacturer of equipment that could be applied?

KNOX A. POWELL,
Research Engineer

Minneapolis-Moline Power Implement Co.,
Minneapolis

• The article was published in the July 23 issue of THE IRON AGE. This is one of the chapters in the reprint booklet, "How To Increase Cutting Tool Life," price 35c. The article tells what equipment is used and also gives grinding wheel specifications. Wright also uses the Bura-Way grinder, a chapter on which also appears in the booklet under the title, "A New Conception in Tool Grinding."—Ed.

Sir:

We are very much interested in your 54-page report, "How to Lengthen Tool Steel Life" and would appreciate receiving at least 4 copies. Please bill us.

FRANK O. HIGGINS,
Vice-President

Higgins Industries, Inc.
New Orleans, La.

MILLING TIME VALUES

Sir:

Have you any data sheets on time values for milling machines? If so, I should appreciate very much any information as to how these may be obtained.

W. R. ELLMS,

Time Study Supervisor
Underwood Elliott Fisher Co.,
Hartford

• Most of the machine shop handbooks give data on milling speeds and feeds, but there is little in print on milling machine time data, although these can be calculated from published tables. We believe that "Time and Motion Study and Formulas for Wage Incentives," by Lowry, Maynard and Stegemerten, gives tables of standard times for various machine operations. This book is published by McGraw-Hill, 330 W. 42nd St., New York, price \$5.—Ed.

BORON-TREATED STEELS

Sir:

In your November 19 issue, you describe some interesting properties of boron-treated steels. Can you tell us where steels of this type are now being commercially manufactured?

A. A. BLUE

Sanderson & Porter,
New York

• See almost any steel producer.—Ed.

SUBSCRIPTION IMPOSTOR

Sir:

We are one of "A. Moore's" victims. He called on us on November 9. We gave him a check payable to the Publishers Service Bureau in the amount of \$26 in payment of a 5-year subscription at \$6 a year less \$4 credit for the balance of this year.

Chapin & Fagin, Inc.,
Buffalo, N. Y.

L. CHAPIN

• "A. Moore," whose real name is A. Yerden, and who issues receipts bearing the name of a non-existent company, Publishers Service Bureau, 428 Fifth Ave., New York, is wanted by manufacturing firms and others in Cleveland and other northern Ohio cities. His most recent field of operations is western New York State. If he should call on you will you please send a wire collect to THE IRON AGE, 100 E. 42nd St., New York.—Ed.

THE EMPTY CHAIR

Sir:

My attention was directed to the editorial, "The Empty Chair," in your Oct. 29 issue. I am interested in obtaining a dozen or so copies.

H. L. ELFNER,
Resident Engineer
International Harvester Co.,
Indianapolis, Ind.

CMP BOOKLET

Sir:

Enclosed find fifty-cents in stamps for which we request that two copies of your booklet, "How To Operate Under the Controlled Materials Plan" be sent to the writer.

H. S. ATKINSON,
Mgr. Clam Shell Bkt. Dept.
Hayward Co.,
New York

Sir:

Please forward four copies of your 16-page booklet, "How To Operate Under CMP."

V. G. MENNELL
Hydril Corp.,
Rochester, Pa.

Sir:

Please send two copies of "How To Operate Under CMP." Enclosed is fifty cents in stamps.

T. F. FAHEY,
Purchasing Agent
American-Terry Derrick Co.,
South Kearny, N. J.

Sir:

Please send two copies of "How To Operate Under CMP." Enclosed is fifty cents in stamps.

E. C. MATTERN,
Production Manager
Safety Car Heating & Lighting Co., Inc.,
New Haven, Conn

• A new enlarged edition containing all the latest information on Controlled Materials Plan is now ready—24 pages. The title is unchanged "How To Operate Under CMP." Price is the same, 25c a copy.—Ed.

CAST IRON ANALYSIS

Sir:

We are interested in "The Effect of Moisture in Blast Air," which appeared in your November 12 and 19 issues. The degree of precision required in the analysis for the hydrogen content of cast iron is beyond the scope of our chemical laboratory.

Could you give us the names of any laboratories which could do this analysis for us?

D. R. STEELE,
Metallurgist
Progressive Foundry Works,
Rochester, N. Y.

• One is Lucius Pitkin Inc., 47 Fulton St., New York.—Ed.

MECHANICAL CHARGING

Sir:

In your article of June 4 page 54 is mentioned mechanical charging in comparison to hand charging. We would very much like to contact the author, in order to get some details of his charging methods.

NORMAN KOHLHEPP
Reynolds Metal Co.,
Louisville, Ky.

• This is difficult as the authors are Germans now living in Germany. The article published in THE IRON AGE is a translation of an article that appeared in a German publication.—Ed.

CHROME PLATED TOOLS

Sir:

We would appreciate receiving six reprints of the article on Chrome Plating process for tools, in your December 10 issue.

W. C. RHODES,
Production Engineer
Air Associates, Inc.
Bendix, N. J.

PRIORITIES GUIDE

Sir:

We wish to acknowledge receipt of the War Priorities Guide. I have found the information contained in THE IRON AGE, in connection with priorities, a great help in our work here.

J. H. McCRODAN
Deloro Smelting & Refining Co., Ltd.,
Deloro, Ont., Canada

Sir:

Please send three copies of the Priorities Guide to the undersigned.

WALTER P. BLUM,
Captain, Corps of Engineers
War Department,
St. Paul, Minn.

TOOL STEEL DIRECTORY

Sir:

We would appreciate receiving a copy of your pamphlet "Directory of Tool Steel."

F. W. DOUGHERTY,
Methods Group, Mfg. Eng. Dept.
Beech Aircraft Corp.
Wichita, Kansas

• Mailed, price 25c.—Ed.

FOOLPROOF GAGING SYSTEM

Sir:

Please send us six more copies of the article "Foolproof Gaging System."

R. N. KING,
Purchasing Agent
Flint & Walling Mfg. Co.,
Kendallville, Ind.

STEEL ANALYSES

Sir:

Please send me a reprint of "Tables Giving Probable Analyses of Steels Used in Principal Parts of Automobile Models of 1939 and Earlier." We understand from the American Iron and Steel Institute, that you have this chart available upon request.

HERBERT BERGGUEN
Automotive Council for War Production
Detroit, Mich.

• These tables, compiled by the American Iron and Steel Institute, were published in THE IRON AGE issue of Nov. 19 under the title, "Significant Steels Commonly Used for Specific Articles." Analyses are not restricted to automotive steels but include as well steels used in manufacturing agricultural implements, aircraft, refrigerators, and other products.—Ed.

Sir:

I find the article, "Significant Steel Commonly Used for Specific Purposes," pages 51-54, of your Nov. 19 issue of particular value to me. Will you please send me a copy.

WALTER J. CHAPMAN
Vega Aircraft Corp.,
Burbank, Cal.

HOME WORK

Sir:

May we please have three additional copies of your Nov. 26 editorial, "Home Work Without Textbooks?"

F. G. MIRICK,
Mgr. Sales & Purchases
F. O. Schoedinger,
Columbus, Ohio

POWDER METALLURGY

Sir:

In the July 23 issue we note you have published a booklet on powder metallurgy, which is available at 25c a copy. Will you kindly send us two copies? Fifty cents is enclosed.

FRED A. BARROW,
Engineer-in-Charge
Receiver Development Department
Canadian Marconi Co.,
Montreal, Que., Canada

H. S. TUBE WELDING

The article, "High Speed Tube Welding," in your Nov. 26 issue, has proved very interesting to various individuals in our organization. The author, G. V. Slottman, of Air Reduction Sales Co., is to be commended. We would like you to send and bill us for eight additional copies.

H. E. NELSON,
Purchasing Agent
Mechanics Universal Joint Div.,
Borg-Warner Corp., Rockford, Ill.

This Industrial Week . . .

- Many Industrialists Regret Dropping of Henderson
- Million More Tons of Steel Forecast for First Half
- 6½ Million Tons Seen Earmarked for U. S. Shipyards
- Holiday Has Little Effect on Ingot Production
- Outlook Still Dark for Non-Essential Users of Metal

STEEL producers and others in industry who have felt Leon Henderson's tongue lashings over the last year were not particularly happy this week after the Price Administrator's resignation under pressure from the Farm Bloc.

In most sections of industry there seemed to be regret that so able, if so tactless, a man should have been forced to leave so vital a job.

Early in his association with industrialists, Mr. Henderson demonstrated what seemed to be a congenital inability to get along with people like Congressmen and other critics but this courage—needed to stand against dangerously large wage and price increases—far offset this weakness.

As one of the bulwarks against the dangers of inflation, Henderson will be missed.

Do you understand CMP? For more questions and answers on the Controlled Materials Plan please turn to page 90. Watch for the new Iron Age Manual: "How to Operate Under CMP."

There is expected to be no important change in OPA price control policy governing basic products such as iron and steel, ore, scrap and metal-working machinery. Whatever may be the scale of expected reorganization of the huge, sprawling OPA, there is rather general agreement that price policy over these products has been soundly and ably administered. Considered against complexities surrounding price control of these products, kinks that developed have been relatively few. For the most part they have been ironed out satisfactorily.

Ex-Price Administrator Henderson, some non-political critics believe, tried to take in too much territory in attempting to control all wholesale and retail prices, covering countless thousands of items, instead of concentrating on basic items, representing the bulk of consumption and costs. Close observers believe that OPA is a strange mixture of both competents and incompetents with some of the latter having marked Leftist economic views that developed conflicts with price controlled and rationed interests.

FORMER Senator Prentiss W. Brown, said to be slated for Henderson's OPA post, is considered a Liberal, and a strong administration supporter. (However, he refused flatly to support the Administration bill to pack the Supreme Court.)

This week the waves that will beat against the head of the new Price Administrator were rising at some points. In Michigan, for example, wildcat strikes are

increasing considerably, and the CIO-UAW publication, *The Workers*, currently carries an attack on Donald M. Nelson, WPB chief, under the caption, "Nelson Has Broken Faith With Labor." Both the UAW and small craft unions in Detroit are vigorously assailing the WLB order fixing wages for tool and die makers at maximums of \$1.65 to \$1.90 an hour in job shops.

Unless strikes, sabotage or other factors grow to an unexpected degree, the steel industry may be expected to deliver 33,250,000 tons of rolled and other finished steel products in the first six months of 1943.

Such an increase in finished steel production would mean that steel consumers will receive a million tons more in the first half of next year than in the like period this year and suggests that the supply of steel next year will be more than adequate for all direct war needs. In addition, there is likely to be more steel available for essential industries such as railroads, whose consumption has been restricted by the WPB.

Non-essential users of steel should not build hopes that any metal will be available for them in any measurable period. Many must wait for end of the war.

AS in 1942, shipbuilding will be the largest consumer of steel in 1943, possibly taking 6.5 million tons in the first half, or about 80 per cent more than was taken in the first half of 1942. While the revised program for shipbuilding for next year is double that of 1942, tonnage of steel to be sent to shipyards is unlikely to increase as fast as ship production itself since inventories at some yards are known to be substantial.

Second largest consumer of steel will be the steel converting and processing industries, including manufacturers of wire and wire products, forgings, and steel foundries, which are likely to take about 3.9 million

Full details of this forecast of rolled and finished steel production and distribution in the first half of next year are carried on page 73.

tons, or close to 7 per cent more than was consumed in the corresponding 1942 period.

As may be expected, steel for the construction industries will drop sharply next year while manufacturers of machinery and tools, including electrical machinery, will receive approximately 1.4 million tons, or about the same amount received during the first half of the current year. (Hiland G. Batcheller, chief

of the WPB Steel Division, points out production of structural shapes and steel piling reached a high point in July, 1942, at 481,814 net tons and has declined to an estimated 350,000 tons for December.)

STEEL production in the U. S. this week sagged a half point to 99 per cent from 99.5 per cent last week, THE IRON AGE estimates. Most steel plants will melt Christmas Day. Even in the case of finishing mill operations, considerable activity will continue through the week, especially on such items as plates and forging bars.

Despite the holiday, Chicago operations this week rose two points to 102 per cent and Youngstown output increased one point to 100.5 per cent. The Cleveland rate was up a half point to 98.5 per cent. Melting operations are down a half point to 100 per cent at Pittsburgh and two points to 92 per cent at Philadelphia. Wheeling dropped a point to 90 per cent, while Birmingham sagged a half point to 97.5 per cent and Cincinnati's rate fell nine points to 100 per cent. St. Louis cut its ingot output by two and a half points to 105 per cent. Eastern District production declined 17 points to 90 per cent. Detroit is unchanged at 102.5 per cent and Buffalo is holding at 104 per cent.

November pig iron production dropped to 5,026,220 net tons from the October peak of 5,165,012 tons, according to the American Iron and Steel Institute. With only 30 days in November, this represents an increase of 0.2 per cent to 101.8 per cent in rate of operations. For the first 11 months of 1942, blast furnaces worked at 99 per cent of capacity, making 54,190,906 tons of pig iron. Output of ferromanganese and spiegeleisen dropped to 57,707 tons from the previous month's total of 71,596 tons.

ONE prospect for next year is even closer cooperation between the WPB's Iron and Steel Division and the steel industry, with major steel problems of production and distribution being settled far more rapidly than was the case several months ago. Recent

unbalances because of rapid changes in the fighting fronts, in Lend-Lease requirements, and in essential needs on the home front have been rapidly cleaned up. Both the WPB and the steel industry have had to adopt a far more flexible attitude than was the case before the North African campaign.

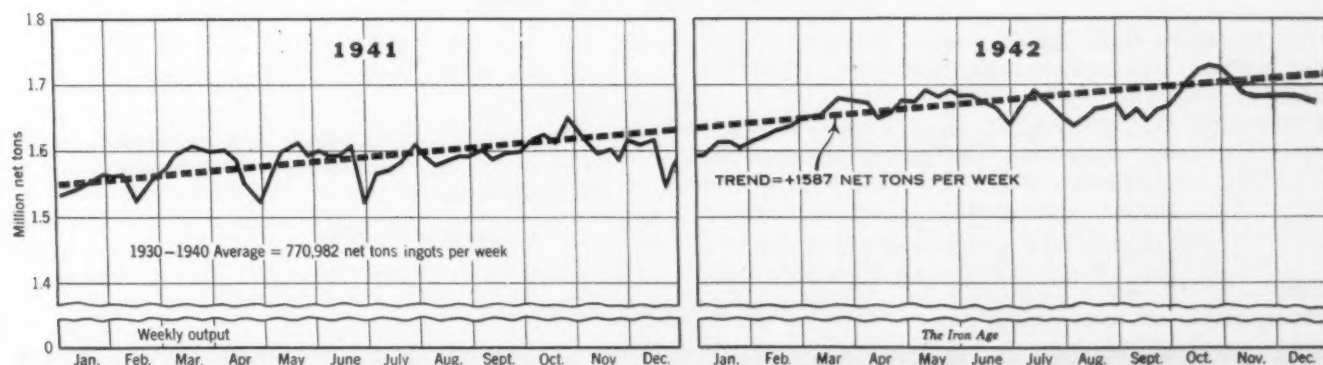
Many of the problems facing the steel industry were being discussed by steel leaders this week. How to increase the use of bessemer steel, and thus release more open hearth steel for other purposes; how to widen the bottleneck on the hot-topping situation; and how to conserve fluorspar and ferrosilicon are up for study. Another question mark is alloy turnings.

Alloy turnings in many instances have gone begging for a buyer with some mills indicating that their war specifications are so exacting that they are unable to use turnings on which a specific analysis is not known. Various moves are being put into operation for greater utilization of bessemer steel, with the WPB insisting that certain items, where the applications are satisfactory, be made of bessemer. This will tend to relieve or release open hearth facilities for manufacture of more exacting special quality carbon and alloy steels.

It may even be that some companies not making bessemer steel will have this steel shipped to them by other companies to be processed, while the first company will in turn ship its open hearth steel to some other plants for further processing. Next year is likely to see much reshuffling of steel between various steel companies, some voluntary, some by direction of WPB.

WHILE there have been some suspensions and cancellations of certain steel product orders because of changes in specific war programs, increased demand from other sections of government departments seems to have offset any decline in total steel demand. Although certain war items are being ordered in less volume, some companies in the past few weeks report an increase in total of orders.

The Iron Age



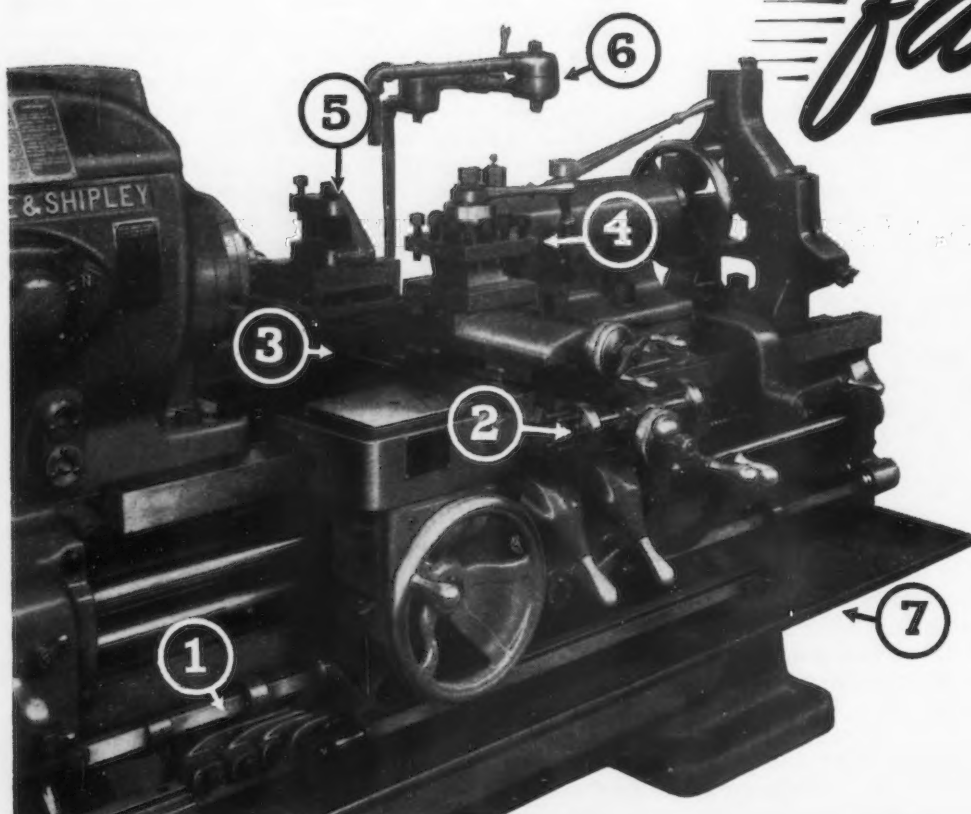
Steel Ingot Production by Districts Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	Ohio River	West	St. Louis	East	Aggregate
December 17...	100.5	100.0	99.5	94.0	98.0	104.5	91.0	98.0	102.5*	109.0	102.0	107.5	107.0	99.5
December 24...	100.0	102.0	100.5	92.0	98.5	104.5	90.0	97.5	102.5	100.0	102.0	105.0	90.0	99.0

* Revised

Produce SMALL Lots

faster



Awarded Navy "E"
March 6, 1942

Why you save time with The Lodge & Shipley Manufacturing Lathe

Change over quickly and easily from one job to another.
Advantageous use of multiple tools and universal holders.
Transfer of diameter and length control from operator to lathe.

OUTSTANDING FEATURES

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|---|--|
| <p>(1) Multiple Length stops (Telescopic Dog Type), automatically disengage longitudinal feeds.</p> <p>(2) Multiple Diameter Stops, for both front and rear tools, can be quickly indexed for establishing diameters. Time wasting "cut and try" eliminated.</p> <p>(3) Connected rear rest increases tooling possibilities. Adaptable to single or multiple tools.</p> | <p>(4) Four-way tool block on compound rest can be indexed for twelve equally spaced tool positions.</p> <p>(5) High duty tool block in rear used for single tool can be supplemented or replaced with multiple holder.</p> <p>(6) Coolant pump and piping.</p> <p>(7) Chip pan.</p> |
|---|--|

WRITE FOR PUBLICATION No. 482

THE LODGE & SHIPLEY MACHINE TOOL CO.
CINCINNATI, OHIO, U.S.A.

ENGINE

TOOL ROOM

AUTOMATIC LATHES

News of

Industry

Consumers to Get 1,000,000 More Tons of Steel in First Half of '43

• • •

• • • Barring strikes, sudden cessation of hostilities, sabotage or acts of God, the steel industry should be able to deliver to consumers at least 33,250,000 tons of rolled and other finished steel products in the first six months of 1943, it is estimated after study of available data on production prospects and future demand.

On that basis, there will be available for consumers of steel at least 1,000,000 more tons in the first half of next year than they got in the corresponding months of 1942. If all operating conditions prove to be ideal in the six months ahead—ample supplies of raw materials, no transportation tie-ups, no extended shut-downs for repairs—the increase may well be even greater.

The estimates indicate that the supply of steel to be available next year will be more than adequate for all direct war needs now in prospect. In addition, there will be more steel available for essential industries such as railroads, oil, farm equipment and utilities, whose consumption has been restricted by limitations put into effect by the War Production Board.

After deducting from the probable output of finished steel the estimates of shipments for shipbuilding, aircraft, ordnance, exports, etc., the tonnage of finished steel available for certain essential industries should be well above their rates of consumption in the closing months of 1942 under the restrictions then in effect.

Thus, railroads, car builders and equipment manufacturers should be able to receive 250,000 more tons of steel per month in the first half of 1943 than they got in October, 1942. Similarly, steel shipments to agricultural implement makers can be 60,000 tons per month higher, and to steel converters and processors 50,000 tons of steel per month higher.

Jobbers and machinery manufacturers can each receive up to 15,000 additional tons of steel per month over their receipts in October of last year, and a similar increase should be available for the oil, gas and mining industries.

As in 1942, the leading steel-consuming industry this year is expected to be the shipbuilding industry. Consumption of 6,500,000 tons of steel products in the first half of 1943 is forecast for this industry, about 80 per cent more than was taken in the first half of

in the corresponding 1942 period.

The railroad and rail equipment industries, including car and locomotive producers, should receive considerably greater tonnages of steel this year than they did in 1942. Shipments of 3,200,000 tons to these groups are forecast for the first half of this year, a tonnage nearly 20 per cent above consumption in the corresponding 1942 period.

Steel for the construction industries this year should be very substantially less than was used for this purpose in 1942, largely because construction of war plants is coming to an end and most other building enterprises have been stopped. The forecast is for shipments of 2,600,000 tons of steel products to construction industries in the first half of 1943, down about 40 per cent from the total in the first six months of last year.

Shipments of steel to jobbers, dealers and distributors in the first half of 1943 have been estimated at 2,700,000 tons. That tonnage is somewhat below jobbers' receipts in the first half of last year, but is above the rate at which they were receiving steel in the final months of 1942.

Lumped together, the automotive and aircraft industries seem likely to take about 2,000,000 tons of steel products in the first half of the year, about 10 per cent more than in the similar 1942 period. The automotive industry's share of that tonnage includes only the steel used for trucks, maintenance parts, etc. Steel for combat vehicles, etc., is excluded here.

Manufacturers of machinery and tools, including electrical machinery, will receive an estimated 1,400,000 tons of steel, approximately as much as they took in the first half of 1942. Although a decline from the present level of machine tool production is forecast for next year, current backlogs of machine tool orders are

New Manual On Operation of CMP

• • • Steel is one of the three vital materials covered by the new Controlled Materials Plan. How to operate under the new plan is the subject of a new booklet prepared by THE IRON AGE and offered to those interested. It contains an overall description of the plan, detailed explanation of how to prepare bills of materials, definitions, questions and answers, and several charts showing operation of the plan.

Copies are available at 25c. each. Please send stamps with orders for four or less. Address THE IRON AGE, Reader Service Department, 100 E. 42nd Street, New York.

last year. The revised program for shipbuilding for 1943 is double what it was in 1942, but, since inventories of steel at shipyards are known to be large, the tonnage of new steel to be sent to shipyards should not be expected to increase as fast as ship production itself.

Ranking second in tonnage are the steel converting and processing industries which include manufacturers of wire and wire products, forgings and steel foundries. The forecast for these industries is 3,900,000 tons, or about seven per cent more than was consumed

expected to sustain operations at the present rate until mid-year.

Steel for containers, principally tin cans, in the first half of 1943, is expected to be 50 per cent below the total of the first half of the year before. The forecast is for 1,200,000 tons of steel for this industry.

Consumption of steel by the oil, natural gas and mining industries in the six months ahead has been estimated at 800,000 tons, somewhat more than in the first half of 1942. About 700,000 has been forecast for the pressing, forming and stamping industries for the first half of 1943. That tonnage would be about one-third below the consumption in the corresponding 1942 months but would be slightly above the rate of shipments to those industries in the final months of last year.

Manufacturers of agricultural implements and farm equipment should receive considerably more steel in the first half of this year than they did in the closing months of 1942. Forecast for the first half of 1943 shipments to this group is 450,000, more than four

times the rate of shipments made in the autumn of 1942.

Combined here for reasons of security, the consumption of steel for ordnance, projectiles, tanks, export and miscellaneous industries in the first half of 1943 should total about 7,800,000 tons, bringing the total tonnage forecast for consumption by all groups in the first half of this year to 33,250,000 tons.

Contractors Selected For Pipe Line Extension

Washington

• • • **Announcement has been made of the selection of 12 contractors for constructing the 857-mile eastward extension of the Texas-East Coast War Emergency pipeline.** The line will be constructed of 24-in. pipe from Norris City, Ill., to Phoenixville Junction, Pa., while the remaining segment consisting of two branches from the latter point to Bayway-Bayonne, N. J., and to Philadelphia, will be built of 20-in. pipe. Completion of the eastward extension is expected by midsummer.

F. D. R. HONORS WORKERS: Scene as the President presented citations for individual merit to ten industrial workers. These men were selected for having submitted the best production improvement suggestions during the Labor-Management Committee drives for ideas conducted on a nationwide basis. They are, left to right: Herbert R. James, McKeesport, Pa.; George B. Smolarek, Detroit; Walter P. Hill, Detroit; William G. Marshall, Director of War Production Drive; Ed. C. Tracy, Camden, N. J.; Clinton R. Hanna, East Pittsburgh, Pa.; Stanley Crawford, Camden, N. J.; Walter Mallet, Rockford, Ill.; Jos. H. Kautsky, Indiana; James A. Merrill, Akron, Ohio; Donald M. Nelson, chairman of WPB and M. E. Butler, Rochester, N. Y.

International News Photo



74—THE IRON AGE, December 24, 1942

Smaller War Plants Corp. Under Way in Region 5

Cleveland

• • • **The Smaller War Plants Corp.** setup is getting well under way in the WPB Region No. 5 which covers Ohio, Kentucky, West Virginia and western Pennsylvania. Daniel B. Ford, deputy regional director, stated that the organization has already placed some contracts. Despite extensive research and planning, the group is ready to function as fast as contracts are available for placement.

Advice to the small manufacturer is not to go to Washington. Instead, manufacturers are requested to write or call the nearest WPB district office, of which there are 16 in the region. Requests to the district office can be handled quickly, accurately and understandingly.

The first step to get on the list of prospective contractors is to obtain WPB Form 1546 from the district office and on it list the production facilities and machine tools of the plant.

The agency indicated that small manufacturers that need money with which to convert plants or buy new machines will contact commercial bankers and, after that, if necessary, the Federal Reserve Bank and the RFC. Smaller War Plants Corp. has an appropriation of \$150,000,000, but plans to use it only in cases where financial aid is unobtainable through usual channels.

McSherry of WMC Returned to Army

Washington

• • • **Paul V. McNutt, chairman,** announced to the War Manpower Commission last week that Brigadier-General Frank J. McSherry, director of operations, is being recalled for active Army service.

Mr. McNutt said, "It is with great reluctance that I have acceded to repeated requests by the Army for the return of General McSherry."

"This is not the first time the Army has discussed with me their own need for the services of General McSherry. We feel fortunate that we were able to retain him on our staff as long as we have."

Two Southern Plants Pass Millionth Shell Forging Mark

Birmingham

• • • Workmen in the shell forging plants of the Tennessee Coal, Iron & Railroad Co. at Ensley, Dec. 16 delivered to the United States Army Ordnance Department the millionth 155-mm., as well as the millionth 75-mm. shell forging. The presentation was made during a visit to the plants by army ordnance and company officials.

The plant making the 75-mm. shell forgings was developed from a pilot plant and delivered the first forging on Aug. 1, 1941. The millionth shell to pass final inspection there came through at 4 a.m. on Dec. 14, 1942.

The 155-mm. shell forging plant delivered its first shell forging on Nov. 20 (Thanksgiving Day), 1941, and came through with the millionth shell forging at 10 p.m. on Dec. 15, 1942, only a few hours behind the record of the 75-mm. plant.

Robert Gregg, president of the company, and some of the plant management officials, accompanied by Col. E. C. Bomar, chief of the Birmingham Ordnance District, and members of his staff, were at the plants Dec. 16 and the shell forgings were presented to Col. Bomar on behalf of the company and the workers by Edward M. Streit and Andrew J. Patrick, Jr., turn foremen of the two plants.

U. S. Steel Shipments Off Slightly from October

• • • Shipments of finished steel products by subsidiary companies of United States Steel Corp. for the month of November were 1,665,545 net tons. The November shipments compare with 1,787,501 net tons in October a decrease of 121,956 net tons, and with 1,624,186 net tons in the corresponding month in 1941 (November), an increase of 41,359 net tons.

For the year 1942 to date, shipments were 19,214,522 net tons compared with 18,612,901 net tons in the comparable period of 1941, an increase of 601,621 net tons.

November shipments were the highest for any November in the history of the corporation. The total for 11 months was also a record.



LEND-LEASE REPORT: Edward R. Stettinius, Jr., sitting across the desk from the President is shown discussing the seventh Lend-Lease report. The report shows that Lend-Lease aid has increased more than a third in the last three months and has reached a rate of \$10-billion a year.

Armor Plate Output Up 400 Per Cent at Lukens

Coatesville, Pa.

• • • Armor plate production at Lukens Steel Co. increased more than 400 per cent during the fiscal year ending Oct. 10, compared to the 1941 fiscal year, Robert W. Wolcott, president, announced.

"Actual tonnage produced cannot be revealed," Mr. Wolcott explained. "But I can say that this 1942 output provided enough armor for a dozen or more warships and for hundreds of Army tanks as well."

U. S. Steel to Buy 11 Small Railroads

Washington

• • • The Interstate Commerce Commission approved a request by the United States Steel Corp. to acquire 11 small railroads now controlled by subsidiaries. The corporation stated that the change in ownership was desired to effect certain savings not possible under indirect control.

The railroads are located in Alabama, Utah, Pennsylvania, Missouri and Ohio. The stock purchase price is expected to be the value shown on subsidiary books which amounts to \$6,252,297.

U. S. S. Texas Sought for Scrap

Philadelphia

• • • A local syndicate is reported here to be seeking authority to salvage the old battleship U.S.S. Texas for scrap. The ship, which is at present moored off Cape Charles, Va., is said to be of the 29,000 ton class and has long been without commission. It has been used as a target ship. The large tonnages of carbon and alloy steels as well as heavy machine castings and numerous sources of non-ferrous scrap make this ship an exceptional salvage prize.

Curtiss-Wright, Buffalo Begins Paying Trainees

Buffalo

• • • Curtiss-Wright Corp.'s Buffalo plants observed Pearl Harbor Day by putting men and women in its training school on the payroll for the first time. Previously, trainees attended school without pay until they were qualified to work on machines in the plants. Now they are getting a straight rate of 50c. an hour until graduation. It is hoped the arrangement will attract persons into war industry.

Steel Products Committees Named By H. G. Batcheller

Washington

••• Hiland G. Batcheller announced at a recent press conference the full composition of the steel products industry advisory committee and the various individual product groups which work with the over-all iron and steel industry advisory committee.

"The industry and labor committees are an important part of this organization and we are counting on them to give us the benefit of their wide experience in the many phases of the production and fabrication of steel."

The general steel products industry advisory committee which works with the over-all advisory group is as follows:

Avery Adams, vice-president, United States Steel Corp., Pittsburgh, carbon steel bars and semi-finished; R. M. Allen, general manager of sales, Allegheny Ludlum Steel Corp., Brackenridge, Pa., stainless steel; N. J. Clarke, vice-president, Republic Steel Corp., Massillon, Ohio, alloy steel; J. A. Henry, vice-president, sales, Weirton Steel Co., Pittsburgh, tin plate; Paul Mackall, vice-president, Bethlehem Steel Co., Bethlehem, Pa., shapes and plates; John Neudorfer, vice-president, sales, Wheeling Steel Corp., Wheeling, W. Va., wire products; L. M. Parsons, vice-president, sales, Jones & Laughlin Steel Corp., Pittsburgh, cold finished bars; W. W. Sebald, vice-president and assistant general manager, American Rolling Mill Co., Chicago, sheets and strip; W. E. Watson, vice-president, sales, Youngstown Sheet & Tube Co., Youngstown, Ohio, pipe; J. H. Parker, vice-president, Carpenter Steel Co., St. Louis, Mo., tool steel; Isaac Harter, executive vice-president, Babcock & Wilcox Tube Co., Barberton, Ohio, tubing; and

A. C. Roeth, vice-president, Inland Steel Co., Chicago, rails and track accessories. The various individual product advisory committees, to each of which a member of the above group is attached, follow:

Tool Steel Industry Advisory Committee

J. H. Parker, St. Louis; Wm. A. Givens, vice-president, operation, Allegheny-Ludlum, Pittsburgh; A. T. Galbraith, vice-president, sales, Crucible, New York; M. W. Saxman, Jr., secretary and general sales manager, Latrobe Electric, Latrobe, Pa.; J. O. Rinek, vice-president, Universal Electric, Bridgeville, Pa.; A. T. Clamage, president, Columbia Tool Steel, Chicago.

Tin Plate Industry Advisory Committee

J. A. Henry; G. E. Totten, manager of sales (tin plate div.), Carnegie, Pittsburgh; B. F. McMahon, manager of sales, Bethlehem, Bethlehem; A. M. Long, assistant general manager of sales, Youngstown, Youngstown, Ohio; N. B. Randolph, vice-president and general sales manager, Granite City, St. Louis; L. Irvine, assistant manager (tin plate division), Wheeling, Wheeling.

Cold Finished Bars Industry Advisory Committee

L. M. Parsons; R. E. Fittsimons, general manager, Fittsimons Steel Co., Youngstown; Fred Young, manager of sales, Republic, Cleveland; Tracy Manville, president, Columbia Steel & Shafting, Pittsburgh; J. Somers, president, Wyckoff Drawn Steel, Pittsburgh; Walter Howell, president, Bliss & Laughlin, Chicago.

Plates and Shapes Industry Advisory Committee

Paul Mackall; Malcolm Farmer, vice-president, Phoenix, Phoenixville, Pa.; W. W. Smith, assistant to vice-president, Inland, Chicago; F. H. Gordon, vice-president, Lukens, Coatesville, Pa.; A. H. Warren, Jr., general manager of sales, Carnegie, Pittsburgh; W. S. Haring, vice-president, sales, Alan Wood, Conshohocken, Pa.

Stainless Steel Industry Advisory Committee

R. M. Allen; C. E. Tuttle, president, Rustless Iron Co., Baltimore; P. F. Voigt, manager, stainless steel division, Carnegie, Pittsburgh and So. Chicago; D. B. Carson, vice-president, Sharon Steel Co., Sharon, Pa.; R. E. Christie, assistant to president, Crucible, New York; Clyde Roberts, assistant manager of sales (alloy division), Republic, Massillon, Ohio.

Alloy Bars and Semi-Finished Industry Advisory Committee

N. J. Clarke; Wm. Gibbons, manager of sales (alloy division), Carnegie, Chicago; R. E. Tucker, manager of alloy sales, Bethlehem, Bethlehem; W. B. Moore, manager, sales, Timken, Canton; Sidney Williams, executive vice-president, Copperweld, Warren, Ohio; Otto Seidenbecker, vice-president, Wisconsin Steel, Chicago.

Sheets and Strip Industry Advisory Committee

W. W. Sebald; E. L. Westein, vice-president, sales, Great Lakes, Detroit; H. E. Robinson, manager of sales, Jones & Laughlin, Pittsburgh; B. J. Wilner, assistant vice-president, Inland, Chicago; J. P. Hosack, vice-president and secretary, Mahoning Valley, Niles, Ohio; R. C. Garlick, general sales manager, Sharon Steel Co., Sharon, Pa.

Pipe Industry Advisory Committee

W. E. Watson; W. F. McConnor, general sales manager, National Tube Co., Pittsburgh; Geo. Clifford, vice-president in charge of sales, Spang-Chalfant, Pittsburgh; D. V. Sawhill, treasurer and general sales manager, Mercer Tube, Butler; E. A. Buxton, in charge of pipe division, Bethlehem, Bethlehem; John Anderson, in charge of pipe division, Jones & Laughlin, Pittsburgh.

Rails and Accessories Industry Advisory Committee

A. C. Roeth; J. C. Dilworth, manager of sales, Carnegie, Pittsburgh; N. V. Orr, vice-president, sales, Colorado Fuel & Iron, Denver, Colo.; J. W. Murphy, assistant manager of sales, Bethlehem, Bethlehem; H. D. Scott, vice-president, operations, Wheeling, Wheeling; J. M. Mulholland, manager of rail sales, Youngstown, Youngstown, Ohio.

Wire Industry Advisory Committee

John Jeudorfer; John May, vice-president and general manager of sales, American Steel & Wire, Cleveland; Henry A. Roemer, Jr., president, Pittsburgh Steel Co., Pittsburgh; W. H. Gardner, general sales manager, Keystone Steel & Wire, Peoria, Ill.; Jack Distler, sales manager of wire dept., Republic, Chicago; Carl Collins, vice-president, Wickwire Spencer, New York.

Carbon Bars and Semi-Finished Industry Advisory Committee

Avery Adams; R. W. Hull, manager of sales, bar division, Republic, Cleveland; L. R. Steuer, manager of sales, bar division, Bethlehem, Bethlehem; M. E. O'Brien, manager of sales, bar division, Inland, Chicago; J. W. Robinson, manager of sales, bar division, Jones & Laughlin, Pittsburgh; W. W. Brown, sales manager, rolled products division, Atlantic Steel, Atlanta.

Tubing Industry Advisory Committee

Isaac Harter; L. L. Brundred, general manager of sales, Spang Chalfant, Pittsburgh; S. L. Gabel, general manager, Superior Tube Co., Norristown, Pa.; J. A. Ireland, manager of sales, mechanical division, Republic, Cleveland; D. T. Marvel, assistant manager of sales, National Tube Co., Ellwood City, Pa.; E. Q. Smith, vice-president, Bundy Tubing Co., Detroit; Wm. Taggart, manager of tube sales, Timken, Canton, Ohio; Aaron Waines, Jr., manager of sales, Ohio Seamless Tube Co., Shelby, Ohio.

WORLD'S LARGEST ENGINE PLANT: This maze of construction is the new Dodge aircraft engine plant—to be the largest in the world. This building alone will cover 50 city blocks and is only one of 15 buildings in the plant. (More horse power, in aircraft engines, will be produced here each week than the generated power of Boulder Dam).

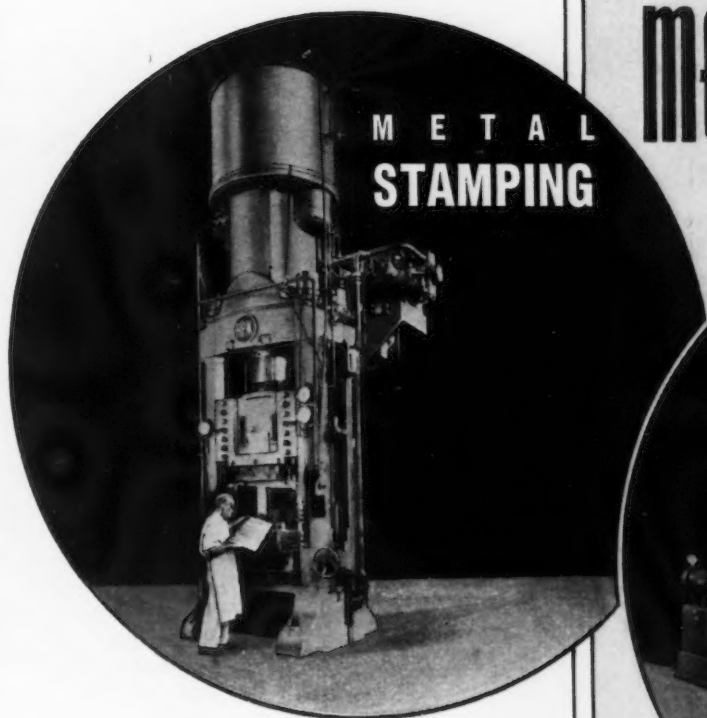
Acme



Foundries Slacken Demand For Pig Iron at Buffalo

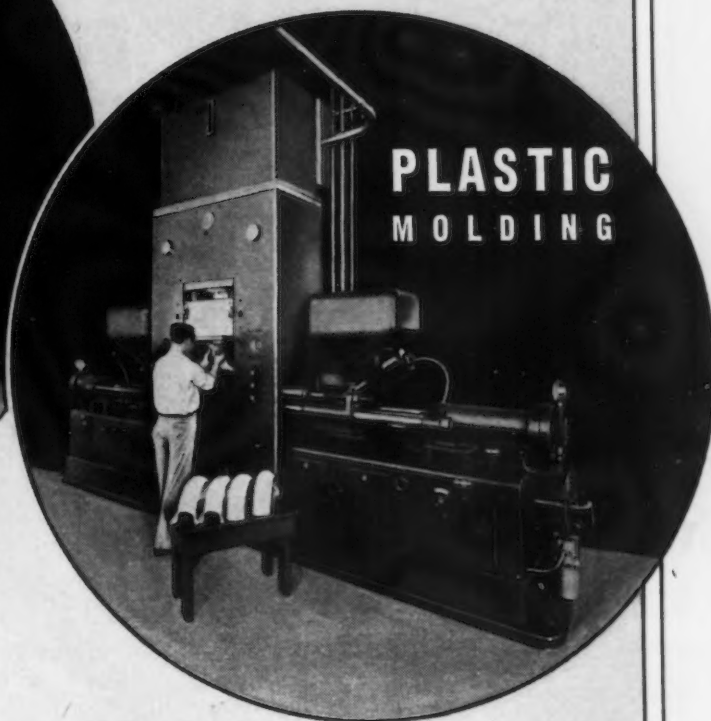
Buffalo

••• Cuts in heats at a few Buffalo foundries has brought a slight slackening in demand for pig iron, but no production curtailment is in sight as any excess will go to the ingot makers. Surprisingly, one of the larger machine tool manufacturers is reported to have called in patterns from local foundries.



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PLASTIC MOLDING

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Metal Specialty's plants are equipped to render you complete service in the fabrication of all metal parts, and in plastic injection molding up through 18 ounces per shot. Along with 850-ton self-contained hydraulic presses for metal working, Metal Specialty has one of the four 18-36-ounce capacity injection presses for custom molding together with full complementary equipment.

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up popped the devil . . .

"So I says to Bill . . . just you be d----d sure those Japs ain't playin' possum. So he heaves a potato masher over the hill and all hell broke loose. That's one nice thing about those toys. After they light there's always peace and quiet."

Holly bomb fuse springs are *dependable*. Why not avail yourself of the same skill and accuracy which enter into their manufacture for your product?

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WMC Unifies Operations With Five Operating Bureaus

••• The polyglot of divisions, offices and services which has made up the War Manpower Commission was unified last week into five operating bureaus by Paul V. McNutt, WMC chief, closely following the Presidential establishment of the WMC as the last word on manpower for the duration.

The five operating bureaus named or created, as the case may be, were: Bureau of Selective Service, Bureau of Placement, Bureau of Training, Bureau of Program Planning and Review and the Bureau of Labor Utilization.

Directors named to head these bureaus were consecutively: Maj. Gen. Lewis B. Hershey (Selective Service); William Haber (Planning); Dr. W. W. Charters (Training); Glen E. Brockway (Placement). No director has been announced for the Bureau of Labor Utilization although Brig. Gen. William C. Rose, head of the Manning Table division of this bureau, will probably serve as acting director pending an appointment.

The responsibility of each bureau was also outlined. The Selective Service will continue along present lines but will coordinate more closely with the Bureau of Placement and other WMC bureaus in its activities. The Bureau of Placement, which presumably swallowed the United States Employment Service, will be responsible for industrial and agricultural employment, federal employment and the placement of professional and scientific workers. The Bureau of Training will be responsible for professional, vocational and technical training, the NYA, the Training-Within-Industry and Apprenticeship programs. The Bureau of Program Planning and Review will handle all reports, research, compilation and relation of labor market data and will coordinate all statistical data for the commission. Details of the responsibilities of the Bureau of Labor Utilization have not been announced but the Manning Table division and in-plant employment problems are expected to come within its scope.

••• Reports of the new organization of the War Manpower Commission have elicited the names of many new appointees to important posts. In the executive director's office, Donald K. Dean of Harvard is named to follow Arthur S. Fleming; Brig. Gen. Frank McSherry, director of operations, is returning to the Army. In the office of the chairman, Fowler V. Harper will continue as deputy chairman; Arthur S. Fleming, civil service commissioner, will continue as presiding officer of the Labor-Management Committee. Under the executive director, assistant directors will be Robert M. Barnett, general and personnel, and Byron Mitchell, field manager. Budget and administrative planning service will be headed by Leonard A'Hearn. General counsel, Bernard Gavit; associate general counsel, Lieut. Col. Edward F. Shattuck. Information service, Philip S. Broughton.

Union Asks Release From No-Strike Pledge

San Diego, Cal.

••• For the first time to date a union has asked release from their no-strike pledge to the President and set a date for a strike vote in event such a release was granted. This unusual occurrence took place at a meeting of AFL Machinists employed by Consolidated Aircraft Corp. and served to protest the alleged inefficiency of a government representative in the aircraft industry's wage stabilization discussions.

Telegraphic request for release from the pledge was sent to President Roosevelt with a copy to William Green, AFL president.

WLB Puts a Union at Pontiac on Probation

Washington

••• Trying a unique form of union control, the WLB granted members of UAW-CIO at the Yellow Truck and Coach Manufacturing Co., Pontiac, Mich., a maintenance of membership clause on a

MANPOWER

probationary basis, revokable if the union failed to end work stoppages which have occurred frequently in this plant.

WLB policy in strike cases has been to refuse any union security clauses. In this case the board was influenced by a unanimous opinion by a three-man panel that union security be granted with the provision that the international union assign a representative to work with the local in ironing out difficulties which have resulted in work stoppages.

WPB Establishes Tool and Die Rates

Washington

••• The WLB established maximum wage rates for more than 50,000 tool and die workers in all jobbing and manufacturing plants in the Detroit area. A special commission was established to interpret and enforce the decision and to rule on disputes over minimum rates in individual cases. The order covers Wayne, Oakland, McComb, Monroe, Washtenaw and Genesee counties, which include such cities as Detroit, Flint, Pontiac, Monroe, Ypsilanti and Mt. Clemens.

The maximum hourly rate for tool and die workers employed in jobbing shops was set at \$1.75. The maximum rate for employees in manufacturing plants was set at \$1.60. The rates were made effective as of Oct. 23.

\$4 Million Bonus Given To Chrysler Corp. Employees

Detroit

••• Approximately \$4-million in Christmas bonus checks were given Dec. 16 to the 49,000 employees of the Chrysler Corp. The bonuses were being paid in place of vacation for 1942 in accordance with a WLB approved plan. The bonus plan also covers employees who entered the armed services prior to Aug. 27, 1942, and who will have returned to their jobs by May 1, 1943.

Railroads Oppose Special Labor Panel

Washington

••• Spokesmen for the railroads protested the handling of railroad

NON-FERROUS METAL PROBLEM?



INVESTIGATE THOMAS ELECTRO-COATED COLD ROLLED STRIP STEEL . . .

● Thomas provides dense, non-porous, crackproof, and peelproof electro-coated finishes. Since these finishes are applied to steel which meets specifications accurately, many manufacturers of war parts find electro-coated Thomastrip adaptable to jobs which formerly used solid non-ferrous metal. The coatings lend themselves readily to forming and drawing operations.

SPECIALIZED PRODUCERS OF COLD ROLLED STRIP STEEL

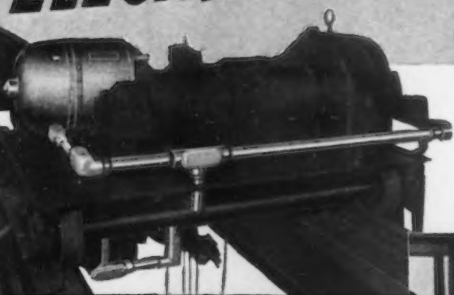


BRIGHT FINISH NOT COATED, SOLDER COATED, ELECTRO-COATED WITH NICKEL, ZINC, COPPER, BRASS

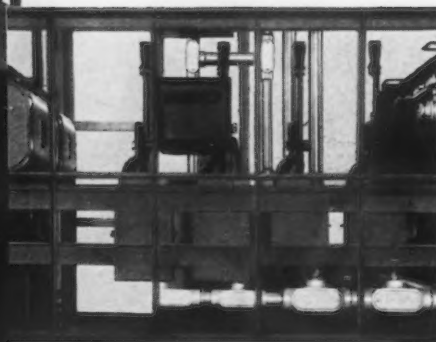
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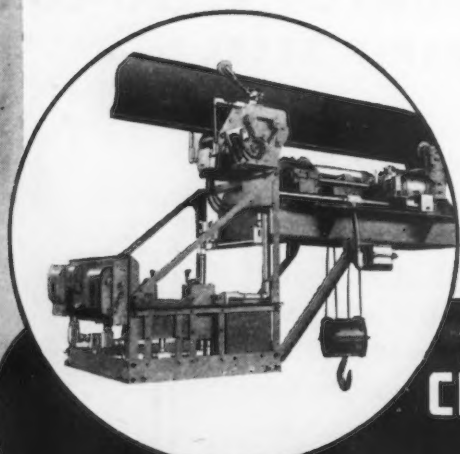
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To all who may be interested we will gladly explain in detail the various exceptional electrical features of Euclid Cranes and Hoists that provide "uncommonly strong electrical constitutions" and are largely responsible for their long life and unexcelled performance.

Write for crane and hoist catalogs and investigate Euclid equipment before placing your next order.



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labor disputes by the special railway labor panel established last May by Executive order and urged the WLB to take over the jurisdiction. The issue was brought to a head by the 30 per cent wage increase now being demanded by the railway brotherhoods which would effect a number of eastern, southeastern and western roads.

The special railway labor panel was created last May 22 by Presidential order following a no-strike pledge by the rail employees which carried with it a request for a special board authorized to handle their grievances.

The railroads, now apparently fearful that the special board will not handle cases under the same policies as the WLB, are protesting the use of a special board and are requesting that the WLB take over. The employees object to the WLB procedure as negotiations through it must wait for a strike ballot before the case is certified to WLB.

Enlistment Easing Is Blow to Manpower

••• The all-service draft which was designed to help the manpower situation by curbing voluntary enlistment for the armed services and assure the orderly withdrawal of workers from industry cannot be put into effect until Feb. 1, Selective Service headquarters disclosed on Dec. 15. This will permit men of 17 through 37 years of age having a 1-A classification to enlist in the Navy, Marine Corps or Coast Guard during the next five weeks and postpones for that period the beneficial effects expected from enlistment-freezing.

Wright Employees to Vote For Union Bargaining Agents

Paterson, N. J.

••• Six plants of the Wright Aeronautical Corp. will go to their polls Dec. 28, 29, 30 to choose a collective bargaining agent for each of the various plant groups represented, thus fulfilling an NLRB order of this month. The office employees, production and maintenance men, carpenters, foundrymen and guards will each have a selection of unions to choose among. Most hotly contested election will be between the

Block-by-Block Hunt For Women Workers

Hartford, Conn.

• • • Block-by-block surveys to induce housewives to enter war plants and part-time use of white collar workers in plants has been resorted to in Connecticut in a last effort to alleviate the pressing manpower shortage, according to William G. Ennis, state director of the USES section of the War Manpower Commission.

Mr. Ennis stated that the labor supply was nearly exhausted in the state and that manufacturers no longer needed to be persuaded to employ women. A state-wide program is being inaugurated to organize a "Victory Corps" of high school students for after school work and several Bridgeport concerns are holding pooled-labor interviews in search of an immediate solution.

UAW-CIO and the unaffiliated Aircraft Workers of America which carries bargaining rights for the production and maintenance workers.

The election order from NLRB came as a result of a UAW-CIO protest against the independent Wright Aeronautical Employees Association which caused disassociation of this union and a call for an election to decide the new bargaining agent.

Penna. Employment Up 14 Per cent in One Week

Harrisburg, Pa.


• • • United States Employment Service offices found jobs for more than 7100 persons in the week ending Nov. 20, a gain of 14 per cent over the previous week's placements, it was reported today by H. Raymond Mason, U. S. Employment Service Director for Pennsylvania.

This addition brought the job placement total for 1942 to approximately 305,000 which is 25 per cent above the total for the corresponding period last year.

Applications for employment received throughout the state in the week ending Nov. 20 totaled 20,150, an increase of 6 per cent over the level of the week before, the report indicated.

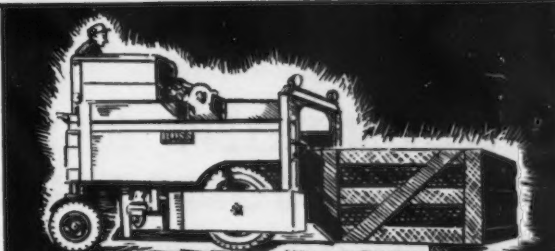
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The ROSS 70-H Carrier approaches load smoothly—backwards or forwards, with Flared Hoist Shoes.

2. THEN UP: Lifts load fast—6" in 2 seconds. The 70-H hoists and travels simultaneously. Operator has clear view of load or ground through open-type frame.



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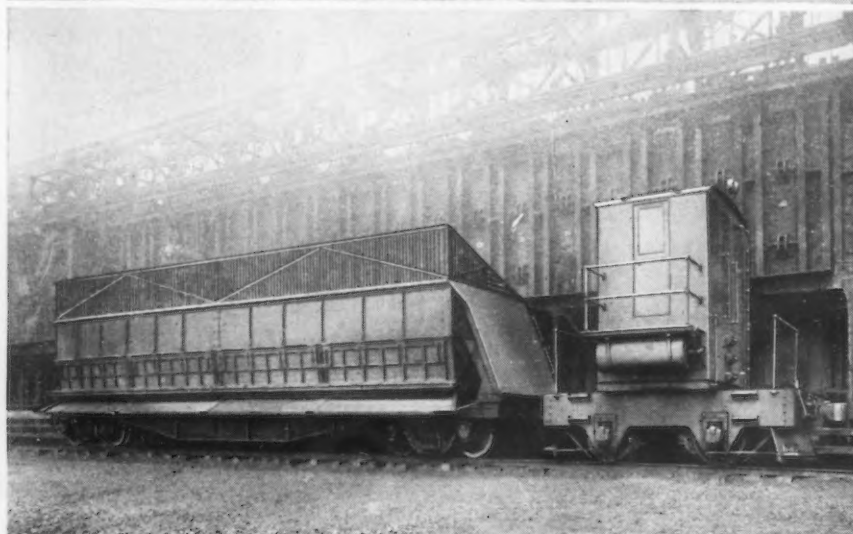
Seattle
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Vancouver, B. C.

Blast Furnace Capacity and Production—Net Tons

	Number of companies	Annual blast furnace capacity	PRODUCTION							
			PIG IRON		FERRO MANGANESE AND SPIEGEL		TOTAL		Percent of capacity	
			Current month	Year to date	Current month	Year to date	Current month	Year to date	Current month	Year to date
DISTRIBUTION, BY DISTRICTS:										
Eastern	12	11,967,680	964,949	10,318,293	20,084	213,138	985,033	10,531,431	100.0	97.0
Pittsburgh-Youngstown	15	24,346,420	2,077,258	22,137,225	18,823	212,856	2,096,081	22,350,081	104.6	100.4
Cleveland-Detroit	9	6,068,470	532,669	5,630,237	-	-	532,669	5,630,237	106.7	101.9
Chicago	6	12,954,800	1,019,095	11,575,669	4,781	49,997	1,023,876	11,625,666	96.1	98.2
Southern	7	4,521,910	359,889	3,769,982	14,019	109,648	373,908	3,879,630	100.5	96.8
Western	2	822,800	72,360	759,500	-	4,189	72,360	763,689	106.9	92.3
TOTAL	37	60,682,080	5,026,220	54,190,906	57,707	589,828	5,083,927	54,780,734	101.8	99.0

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NOVEMBER PIG IRON PRODUCTION fell 5,026,220 net tons from the peak of 5,165,012 tons reached in October, according to the American Iron and Steel Institute. With only 30 days in November, this represents an increase of 0.2 per cent in rate of operations, of 101.8 per cent for the 11 months of 1942, blast furnaces worked at 99 per cent of capacity, making 54,190,906 tons of pig iron. Output of ferromanganese and spiegeleisen fell to 57,707 tons from the previous month's total of 71,596 tons.

During 1941 the companies included above represented 99.8% of the total blast furnace production.

Production Welding Course To Be Given by Lincoln

Cleveland

••• A special intensive five-day welding production course will be held in Cleveland the week of Jan. 11, at the plant of The Lincoln Electric Co. Organized for foremen, supervisors, production engineers, superintendents, managers and all executives interested in greater welding production, the course will concentrate on helping the men in attendance to get more welding production quicker at less cost in their own plants. Lectures and practical demonstrations, plus an opportunity for each man to put into practice and test out the new welding methods and procedures outlined, will make up most of the intensive five-day schedule. Greatly increased speeds of welding can be obtained by proper application of larger electrodes, better fit-up, and special positioning jigs and fixtures. The welding production course will cover the proper engineering of these subjects so that men in attendance can put the principles into immediate use.

Application to attend the welding production course should be made in advance to The Lincoln Electric Company, 12818 Coit Road, Cleveland, Ohio.

Plane Firm Seeks New Kind of Designer

• • • A new kind of tool designer was sought recently in the East. A "well known maker of gliders and airplanes" began advertising for a "woodworking tool designer and engineer."

His work will cover one of the most interesting applications of woodworking to aircraft manufacture, the advertisement continued. A substantial salary was offered.

United States Steel Supply Co. New Name of Subsidiary

• • • The name of Scully Steel Products Co., United States Steel Corp. subsidiary, will be changed to United States Steel Supply Co., effective Jan. 1, 1943. E. E. Aldous, president, announced that the new name will not involve any change in the management or the business in which Scully Steel Products Co. has been engaged. The principal reason for the change is to identify the supply company more closely with other subsidiaries of United States Steel Corp. General headquarters of United States Steel Supply Co. are located at Chicago.

Lake Superior Ore Used In 11 Months up 9 Million Tons

Cleveland

• • • Iron ore consumption during November totaled 7,455,778 gross tons, as compared with 7,598,664 tons consumed in October and 6,501,027 tons in November, 1941. Total furnace consumption of iron ore, including open hearth ore and Lake Superior ore consumed at plants which also use other ores, during the past 11 months amounted to 78,466,094 tons, while during the same period of 1941 consumption amounted to only 69,273,701 gross tons. Ore consumption during November and during the past 11 months for the United States alone amounted to 7,227,497 and 76,173,610 gross tons, respectively.

Ore stocks at U. S. furnaces on Dec. 1 amounted to 45,031,003 gross tons while a month ago stocks were 44,415,052 gross tons. Total stocks at both American and Canadian furnaces on Dec. 1 totaled 46,552,019 tons, as against stocks of 45,-

883,243 gross tons a month ago. Stocks at the Lake Erie Docks amounted to 7,151,439 gross tons on Dec. 1, bringing total iron ore stocks, both in United States and Canada to 53,703,458 gross tons, as against 52,667,282 tons on Nov. 1, 1942. Stocks in the United States alone amounted to 52,182,442 gross tons.

Of the blast furnaces in United States and Canada depending prin-

cipally on Lake Superior Ore, there were 181 in operation on Dec. 1, with 10 idle. The total number of furnaces, 191, includes the new Inland Steel Co. furnace at Indiana Harbor, Ind., and the nine Canadian furnaces. On Nov. 1, there were 183 furnaces in blast, of which 174 were American furnaces and nine were Canadian, while there were only seven furnaces idle, all of which were in the United States.

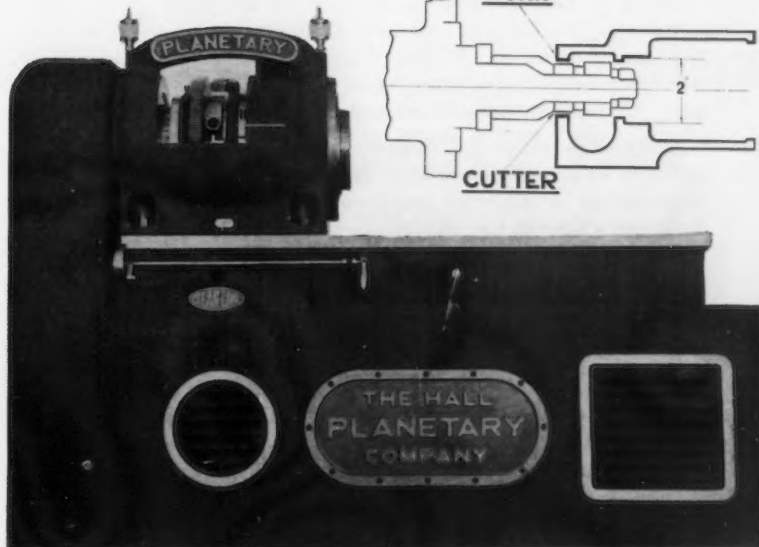
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OPA Announces Changes in Used Machine Tool Price Order

••• Standard definitions used in other price measures covering machinery, machine tools and machinery parts are incorporated in Revised Price Schedule No. 1—Second Hand Machine Tools—in

an action announced Dec. 18 by OPA.

A major change is the elimination of welding equipment from the scope of the schedule. Both new and used machines for join-

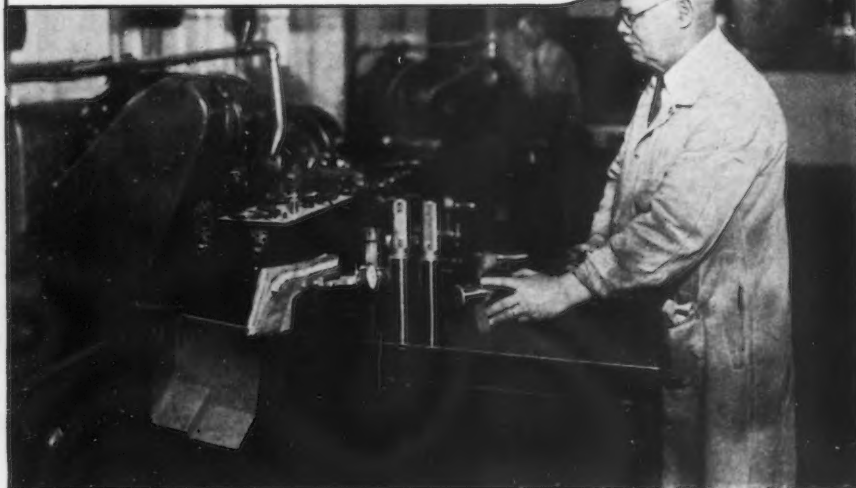
ing metals are now brought under the control of Maximum Price Regulation No. 136—Machines and Parts and Machinery Services. This is accomplished in Amendment No. 2 to Revised Price Schedule No. 1, effective Dec. 23, by changing the definition of "used machine tools" to bring it into line with the definition of machine tools in Revised Price Schedule No. 67 (New Machine Tools). Specifically, all used machine tools for cutting, abrading, shaping and forming of metals are now covered by the schedule.

Another important change—corresponding to a clause already incorporated in Regulation 136—now makes it possible for federal, state, and local government agencies to sell rebuilt—or equivalent to rebuilt—machine tools at the maximum price for rebuilt and guaranteed machine tools without the required guaranty of 30 days' satisfactory performance. Since many government agencies lacked the authority to extend such guarantees the provision now allows them to provide a certificate of condition in lieu thereof. A qualified person, not a dealer, satisfactory to the purchaser, must certify that the worn or missing parts have been replaced or reworked and that the machine tool has been tested under power indicating that it has a substantially equivalent performance to that of the machine tool when new.

Another change requires that a rebuilt and guaranteed machine tool must be invoiced as a rebuilt and guaranteed machine tool, or its equivalent, and brings the definition of the term "rebuilt and guaranteed" into line with the definition in Maximum Price Regulation 136.

The definition of the term "dealer" is revised to include any person purchasing second-hand machine tools for resale so that the definition is in line with the definition of the term "dealer" in Supplementary Order No. 20 which licenses second-hand machine tool dealers. As now defined, the term dealer means "a person engaged in the business of purchasing for resale or of selling or negotiating the sale of second-hand machine tools or extras, whether as a principal or as an agent or broker." Purchasing for resale includes the purchase of any second-hand machine tools or extras for resale after repairing or rebuilding."

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Rejects of parts because of incorrect surface finish can be eliminated when Profilometers are used to check set-ups at the time the first piece is produced. Waste of following machining time is reduced to a minimum. Man hours are spent only on fully productive operations. Critical materials do not end up in a scrap heap.

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*Profilometer is the trade name registered in the United States Patent Office by Physicists Research Co.

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Stainless Steel Drums

••• A maximum price of \$35 each was established Dec. 14 for reconditioned 55-gal. stainless steel drums which manufacturers can no longer use because of war regulations.

The OPA action is contained in Amendment No. 1 to Revised Price Schedule No. 43, effective Dec. 19.

New Imports Provision

••• Increases in total landed costs of imported commodities subject to the General Maximum Price Regulation may be added by an importer who sells to an intermediate distributor as well as to an industrial user.

This provision is contained in a revision of Supplementary Regulation No. 12, effective Dec. 19. It further provides that if no delivery of the commodity in question was made during March, 1942, the importer may add to his ceiling price a "fair allowance for increases in the total landed costs."

The intermediate distributor may, in turn, add to his ceiling price the increase paid by him when selling to an industrial user. Either the importer or the intermediate distributor may process the imported commodity to some extent before delivery is made.

Selling Price Clarified

••• The selling price of a used machine, one of the factors in the definition of "critical industrial machinery" as given in Order L-83, was clarified by WPB last week. The agency pointed out that in the case of a used machine the term "selling price" includes not only the selling price of the used machine, but also the cost of such repairing or reconditioning as is necessary to make the machine an effective instrument.

Light Relaying Rail Prices

••• Maximum prices for light relaying rail and relaying girder rail were established Dec. 15 by OPA.

Relaying rail of less than 35 lb. per yard, generally used in industrial plant and mine tracks, will have a top price of \$45 a gross ton f. o. b. warehouse in carload lots. A maximum price of \$2.25

per cwt. is fixed for less than carload shipments, with 15 cents a ton added for shipments of less than five net tons.

Relaying girder rail, used principally for city street car tracks, will have a ceiling of \$45 a ton minus railroad transportation from the nearest shipping point to the basing point. It is provided, however, that the shipping point price need not be less than \$39 per gross ton.

These specific prices are contained in Amendment No. 3 to Revised Price Schedule No. 46, which did not originally include maximum prices for lighter, reconditioned rail types.

The amendment effective Dec. 19, further provides for the licensing of dealers and waives the requirement for regular monthly reports as most rails of these classifications are being sold to the armed forces.

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Complete Control Placed over Electric Furnace Carbon Steel

••• Complete control over the production and delivery of carbon steel made in electric furnaces was established by amended Conservation Order M-21-a, Dec. 14. Previously, the order applied only

to alloy iron and alloy steel. Producers may not melt or deliver alloy iron, alloy steel or electric furnace steel before approval is granted by WPB.



For many years Wyandotte Metal Cleaner F. S., on full automatic lines, cleaned tons of steel prior to plating. It was chosen because of its high speed efficiency in removing fabricating compounds and its remarkable ability to remove so-called "carbon" smut.

Today this same proved compound is at work giving excellent results in cleaning prior to cadmium, zinc, or hard-chrome plating in hand-operated or full-automatic lines at war production plants.

Wyandotte F. S. (ferrous smut) Cleaner does not give off irritating fumes in high current density anodic cleaning baths. It dissolves instantly . . . has perfect rinsibility . . . exceptionally long-lived in solution.

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SERVICE REPRESENTATIVES IN 88 CITIES

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• WYANDOTTE, MICHIGAN

At the same time, two related steps were taken by WPB:

1. A new order, M-21-h, was issued establishing control of the production of carbon and alloy tool steels. Formerly, tool steel production was regulated by orders M-21-a and M-14.

2. The provisions formerly contained in M-21-a relating to tool steel, and the entire order M-14 were revoked, making M-21-h the only order controlling tool steel production.

The order restricts monthly production of certain high molybdenum type steels to 30 per cent of the monthly average tonnages melted during the second quarter of 1942. Delivery of these tool steels is limited to 75 per cent of the same base period in the fourth quarter of 1942, and to 35 per cent in the first quarter next year.

Furnaces Curtailed

Washington

••• Iron and steel that might otherwise become tied up in inventory will be made available for direct war use, WPB explained in an announcement last week adding that except for urgent military needs all further production of steel furnaces for direct-fired air heating systems will be halted after Dec. 31. This curtailment provision was provided in Order L-22-a.

Manufacturers are prohibited from fabricating or assembling any steel furnaces of the types described in the order except when the purchase is specifically authorized on Form PD-704. This form will be used by governmental agencies to obtain heating units.

Restrictions are placed on the amount of iron and steel that may be put into process in any calendar quarter for manufacture of replacement parts for steel furnaces. After Dec. 31, each producer of parts is permitted to use iron and steel in any succeeding quarterly period not to exceed 200 per cent of the weight of metal put into process by him for the same purpose during the corresponding quarter of 1940.

Tin and Terne Plate

Washington

••• The following new uses for tin and terne plate were permitted by an amendment to Order M-21-e, issued Dec. 11:

Component parts for internal combustion engines, including fuel, cooling and lubrication systems (but only where the need for corrosion-resistant or solderable parts makes the use of less essential

material impracticable), electrical equipment parts requiring solderable coatings. Gas mask canisters, safety cans for inflammable liquids, vaporizing liquid fire extinguishers; wick holders for oil stoves (replacement only), heat exchangers, maple syrup evaporators, and linings of drying chambers for milk and egg dehydration.

Other modifications contained in the order follow: The definitions of tin plate and terne plate have been changed to exclude certain materials; materials outside the gage range from 75 to 112 lb. per base box which were in inventory on May 16 were excluded from the restrictions of the order; provisions requiring reports of frozen stocks have been eliminated.

The War Shipping Administration was exempted from the order's restrictions, and information is no longer required in connection with sales to the Army, Navy, and Maritime Commission; new report forms for producers and purchasers which have been in effect for the fourth quarter of 1942 are now specifically referred to.

Glycerin Order Tighter

•••Control over glycerin was tightened to limit deliveries without specific WPB authorization to 1,150 lb. per month, by the terms of General Preference Order M-58 as amended Dec. 11. The previous order exempted from direct WPB allocation control any shipment by a producer of 10,000 lb. or less per month.

A revised form PD-363 A is to be filed by suppliers under the new order. Form PD-600 is to be filed by consumers of over 1,150 per month.

Cobalt under Allocation

Washington

•••WPB last Friday placed cobalt under complete allocation with the revocation of M-39-b and previous M-39 regulations and issuance of Order M-39 revised. The exceptions to the complete allocation are purchases of 25 lb. or less which may be delivered during any one month to any consumer without specific authorization. Previously 50 lb. could be delivered monthly without specific authorization.

The list of products for which cobalt may be used has been regrouped to restrict further the use of cobalt in protective coatings, in non-ferrous alloys and in ground coat frit (necessary for enameled steels).

The permitted uses are now as follows: catalysts; cattle and plant food; decolorizer for glass, but not in excess of one pound of cobalt element per 100

tons of glass; driers for floor and deck paints, varnishes, interior trim enamel and printing ink; ground coat frit on orders rated AA-3 or higher; health supplies; highspeed steels; laboratory and research equipment; magnets; non-ferrous alloys on orders rated AA-5 or higher; and in pigment for glass for optical and safety purposes.

Protective coating manufacturers who use cobalt must certify to the drier manufacturer that the material will be used only for the varnish, enamel and ink purposes listed above. As a result of this provision, protective coating makers will no longer have to secure monthly allocations from WPB. The use of cobalt by such manufacturers will be controlled by allocation to the manufacturers of the driers.

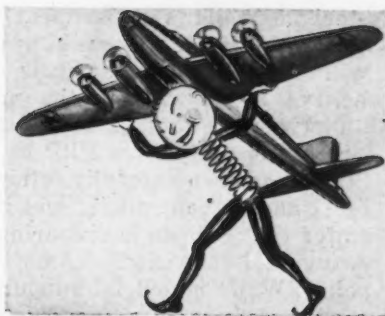
Refiners and processors of crude cobalt are required to file monthly reports on

form PD-581 showing inventory position and schedule of production for the ensuing month. All persons who on the first day of a calendar month hold an inventory in excess of 100 lb. of contained cobalt must file a monthly report with WPB whether or not an allocation for the ensuing month is required.

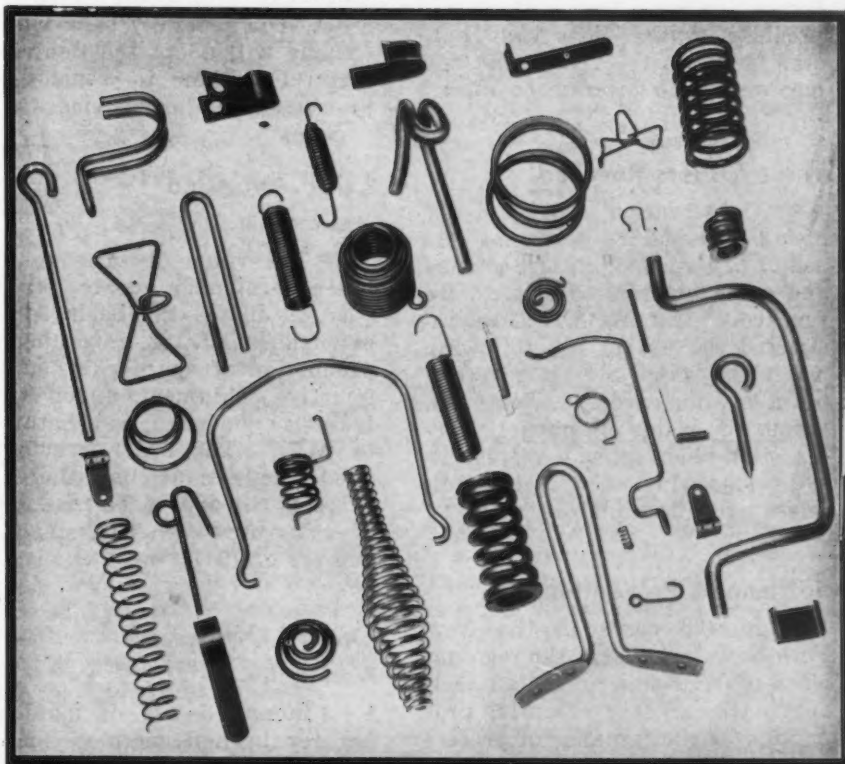
WPB Clarifies Requisitioning of Copper Washington

•••Last Monday WPB pointed out that to avoid misinterpretation the government is determined to

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requisition copper and copper base alloy products on the following basis: Any and all copper and copper base alloy products in primary form, except those whose cost to the holder was substantially above the 28c. and 30c. maximums set forth in the copper recovery price schedules; any and all copper and copper base alloy fabricated products, except those which have been fabricated from primary forms whose cost to the holder was substantially above the 28c. and 30c. maximums mentioned in the copper recovery price schedules. WPB said these exceptions are clearly indicated in the copper recovery schedules and that there are no others.

The occasion for this clarification arose from the language of press release OPA T-64 of Nov. 4 relating to prices offered by the Copper Recovery Corp. for idle or excessive inventories of copper and copper base alloy products. The press statement said:

"The WPB points out that sale of all items is not compulsory and will not be sought through requisitioning. Among these are products whose costs was substantially above 28c. and 30c. maximums the government offers."

Three Orders Revoked

••• Conservation orders M-108, M-116 and M-158, governing the use of can enamel, closure enamel and drum exterior coatings, were revoked. The WPB orders restricted the use of the following materials, which are all governed by allocation orders: Tung oil, citic acid, castor oil, phenolic resins, para-phencapheol resins, alkyl resins, vinyl resins, ethyl cellulose and nitrocellulose.

Bottlenecks Prevented

••• In 420 cases in the New York-New Jersey area the regional office of WPB has prevented serious bottlenecks in essential production by the issuance of preference ratings for emergency repairs. H. M. Brundage, New York deputy regional director of WPB in charge of materials and priorities, announced recently. Average cost of the materials involved in these cases was \$80.

The emergency repair procedure, under which the regional of-

fice was authorized to issue preference ratings up to A-1-a for emergency repairs not exceeding \$500, has now been streamlined as the result of an administration order empowering the regional office to issue ratings up to AA-2X.

Canada Drops Symbols; May Use Controlled Materials Plan

Toronto

••• The Canadian allocation classification system for steel and other metals has been rescinded, under an order by F. B. Kilbourn, steel controller.

Local interests in touch with the steel controller's department are of the opinion that something new will take the place of symbols, and believe it will follow the move underway in the United States. The swing away from PRP in the States has been carefully followed by Canadian controllers, and it is stated that Canada is preparing to swing in line with the American policy. While no official announcement has been made in this respect, it is generally believed that Canada will adopt the Controlled Materials Plan, to replace the present system or systems.

L-158 Amended

Washington

••• The value of sales for the average calendar quarter of 1941 was set up as the basis for all extensions of L-158, governing the production of spare parts of automotive equipment, under Order L-158 as amended last Saturday by WPB. The order previously fixed production limitations by using as the base period the value of sales for the "corresponding quarter of 1941."

Order L-229 Issued

Washington

••• Increased use of materials for repair and maintenance of street cars, trolley buses and rolling stock of urban elevated and subway systems was authorized for 1943, as compared with 1942, while production of spare parts for those purposes was placed under regulatory control by the issuance of Order L-229 last Saturday. Manufacturers were au-

thorized to schedule production of replacement parts ordered by or for carriers as if the order bore a rating of AA-2X. This action, it was stated, is intended to insure scheduling of production of these parts ahead of lower rated orders, and is expected to result in more prompt delivery to the carriers. Carriers will be permitted to acquire new parts for maintenance and repair in amounts in proportion to the growth in volume of passenger service.

Beginning Jan. 1, each carrier may acquire new materials and parts in any succeeding quarterly period in quantities proportionate to the ratio of schedule vehicle miles for the 1943 quarter as compared with the corresponding total for the similar quarter in 1942. When worn or damaged parts can no longer be used and cannot be reconditioned, the carrier must dispose of the material for scrap within 30 days after acquisition of the replacement.

The order permits increased production of spare parts in 1943 but limits each producer, by quota, to an allowable percentage of his 1942 output. During the first quarter of 1943 each producer may manufacture repair parts in an amount not exceeding one-fourth of 115 per cent of last year's production. Manufacturers' costs are the basis for determination of quotas.

No materials may be used in the production of replacement parts except in accordance with all applicable "M" orders or other restrictions on the use of critical materials. Railroad vehicles, operated either by steam or electricity, do not come within the provisions of L-229.

Interpretation of L-170

Washington

••• Purchasers of farm equipment businesses are classified according to their individual annual total net sales plus the sales of the business bought, according to an interpretation of Order L-170 issued by WPB last Saturday. The interpretation explains the method of determining the classification of an assignee, and clarifies his rights in the production of any quota allotted under L-170 to the assignor.

Every Ounce Seems to Count

Washington

••• Almost nothing will be left of the wire stitch in paper match books, but WPB, still miserly with steel, has announced that WPB and match manufacturers are considering a reduction of the stitch a quarter of an inch. This slash, the figure hound will be intrigued to learn, will save 20 per cent of the steel wire required, or about 100 tons of steel annually! At the present rate of production this would mean, according to another

This Week's Priorities and Prices

Changes in the method of authorizing PRP units to purchase aluminum, magnesium, steel and copper during the first quarter of 1943 have been announced. The revisions are designed to facilitate transition from PRP to the Controlled Materials Plan. (T-1368)

Cobalt was placed under tighter control by Order M-39 as revised. (T-1375)

Selling rather than appraisal prices are now the factor for determining whether judicial sales of used machinery, parts and second hand farm equipment are under federal price control, according to Amendment No. 1 to Supplementary Order No. 10, effective Dec. 17. (OPA-T-391)

Certain special cutting tools may be delivered up to the lowest quantity that can be efficiently produced by the manufacturer, according to revised order E-2-h. (T-1379)

Carbon steel made in electric furnaces was placed under complete control in amended order M-21-a. (T-1391)

Relaying rail and girder maximum prices have been set in Amendment No. 3 to Revised Price Schedule No. 46. (OPA-1286)

Steel furnace production for direct-fired air heating systems will be halted after Dec. 31 under Order L-22-a, except for urgent military needs. (T-1397)

A maximum price of \$35 each was established for reconditioned 55-gal. stainless steel drums which manufacturers can no longer use because of war regulations, through Amendment No. 1 to Revised Price Schedule No. 43, effective Dec. 19. (OPA-T-401)

■ ■ ■

For copies of above announcements address Office of War Information, Washington, giving announcement number as shown in parentheses after each paragraph. (For example, WPB-600 means announcement 600 issued by the War Production Board.)

Revisions to The Iron Age Priorities Guide

• • • The following data, together with all intermediate weekly revisions in THE IRON AGE, should be added to THE IRON AGE Priorities Guide published with the issue of October 8 to bring the Guide up to date.

"M" Orders:

- M-14...Revoked (12-14-42).
- M-21-a...Amended order establishes complete control over production and delivery of carbon steel made in electric furnaces (12-14-42).
- M-21-d...Interpretation (12-11-42) states that orders for corrosion and heat resistant steel, if approved on form PD-391, can be completed even if rated lower than AA-5.
- M-21-e...Amended order permits several new uses of tin plate andterne plate (12-11-42).
- M-21-h...Order establishes control of carbon and alloy tool steels. (12-14-42).
- M-39...Revised order places cobalt under tighter control (12-11-42).
- M-63...Revised effective Dec. 28. Import controls extended.
- M-108...Revoked (12-17-42).
- M-116...Revoked (12-17-42).
- M-158...Revoked (12-17-42).

"P" Orders:

- P-16-b...Amended order (12-16-42) relaxes restrictions on construction of utility lines to furnish gas or electric service to domestic ranges.

"E" Orders:

- E-2-b...Amended order permits a purchaser to obtain preferential delivery of certain special cutting tools up to the lowest quantity that can be efficiently produced by the manufacturer (12-12-42).

"L" Orders:

- L-1-g...Amended to permit manufacture of 300 semi-trailer petroleum tanks to help relieve the oil shortage (12-10-42).
- L-22-a...Order restricts production of steel furnaces (12-14-42).
- L-33...Amended order prohibits production of portable electric lamps and shades containing critical materials (12-12-42).
- L-71-a...Order restricts production of B batteries to standardized sizes of B battery terminals in all makes with voltages limited to four sizes (12-14-42).
- L-83...Interpretation No. 1 (12-17-42) provides that the term "selling price" pertaining to a used machine includes cost of repairing and reconditioning.
- L-91...Amended order states that Army and Navy must notify WPB in advance of purchases of commercial laundry and dry cleaning equipment (12-14-42).
- L-123...Interpretation No. 2 (12-14-42) states that order does not apply to certain spare parts for new equipment.
- L-158...Amended order sets up basis for production of spare parts of automotive equipment (12-12-42).
- L-179...Interpretation No. 1 (12-12-42) states that classification of a buyer of a farm equipment business is based upon his own previous total net sales plus the sales of the purchased business.
- L-183...Amended order provides producers with simplified schedule reporting procedure and extends effective date of order until Feb. 15 (12-17-42).
- L-221...Amended order clarifies possible misunderstandings regarding the deadline for deliveries of electric motors and generators (12-11-42).
- L-225...Order curtails installations of rigid electrical conduit and electrical metallic tubing, flexible conduit and tubing, metal raceways, etc. (12-16-42).
- L-229...Order permits increased use of materials for repair and maintenance of street cars, etc., and puts production of spare parts for those purposes under regulatory control (12-12-42).

figure hound who insists that his identity remain secret, about .000000010 seconds of operation and very little if any wire remaining.

L-123 Interpreted

Washington

• • • Spare parts for new equipment are not included in the exemption distribution control of general industrial equipment for certain repair and maintenance purposes. This was made clear by WPB last week by an interpretation of Order L-123, which explained that equipment is considered "new" when it has not been

delivered to a person acquiring it for use. It was also pointed out that the exemption is intended to provide for the repair and maintenance of any existing equipment which has been delivered for use, including equipment delivered prior to issuance of the order.

OPA Injunction Hits Warehouse Firm

Detroit

• • • A permanent injunction was issued in Detroit in Federal Court on petition of the Office of Price Administration forbidding the Newburgh Steel Co., warehouse steel firm, from violating OPA or-

ders. The injunction followed a petition filed recently charging that the concern had sold considerable steel to Higgins Industries, Inc., at prices above ceiling levels established by OPA.

Ruttenberg Is \$1 Year Man

Washington

• • • In the Dec. 10 issue it was stated in error that Harold Ruttenberg, CIO-USW research director is serving as labor advisor in the WPB Steel Division at a salary of \$6500 a year. It now develops that Mr. Ruttenberg has been sworn in as a dollar a year man, says H. G. Batcheller.

Operations Under New Controlled

Q.—What do I do now about Bills of Materials?

A.—Producers of Class A Products:

A. Do not prepare any bills of materials or make requests of your secondary consumers for bills of materials until requested to do so by a Claimant Agency or Industry Division of the WPB, or by your customer if you are a secondary consumer. Authorized forms for bills of materials contain a number of the Bureau of the Budget for identification.

B. Upon receipt of such a request, study the instructions accompanying the request carefully as the amount of detailed information required varies with products.

C. Generally, these instructions will call for a listing of CMP materials required per unit or units, including the materials required by your secondary consumers. In all cases, requirements of Class B, Group I products are listed as such on Form CMP-3, and the materials required for such products are not included. Class B, Group II products are not to be listed.

Producers of Class B Products:

A. Do not prepare any bills of materials until requested to do so by an Industry Division of the WPB. Wherever possible, WPB is using information already available concerning material requirements for Class B products.

B. Upon receipt of a request for a bill of materials to be prepared on a form identified by a Bureau of Budget number, proceed as instructed by the request. Study the instructions accompanying the request carefully, as the amount of detail required varies with the product. This is especially true of Class B products.

C. Do not include materials required for other Class B, Group I products which you incorporate in your product on which the bill is being requested. Merely list such products on Form CMP-3.

D. Do not list Class B, Group II items in any case.

Q.—As a Class A producer, how do I get materials under CMP?

A.—1. Application blanks for allotments of controlled materials will be issued by Claimant Agencies to prime consumers some time during January, 1943. Prime consumers will be requested to make application for controlled materials required by themselves and their secondary consumers for delivery during the second quarter of 1943 to meet authorized schedules approved by the Claimant Agencies.

2. Prime consumers will issue necessary application blanks to secondary consumers requesting them to apply for controlled materials needed to meet production schedules approved by prime consumers covering the second quarter of 1943.

3. Secondary consumers will submit the properly filled-out applications to their prime consumers or intermediate secondary consumers.

4. Prime consumers will submit the properly filled-out applications to their Claimant Agencies.

5. Claimant Agencies will then review the applications and will issue allotments, preference ratings, and authorized schedules to prime consumers. This should start early in February of 1943.

6. Prime consumers will, upon receipt of allotments, preference ratings and approved production schedules from Claimant Agencies, issue or extend the same to their secondary consumers.

7. Upon receipt of his allotment, a consumer will place his purchase orders (or modify existing orders by schedule releases) so as to conform with the allotment, preference rating and authorized schedule which he has received. He will use the allotment for purchase of controlled materials and for making further allotments to producers of Class "A" products, to be incorporated in his product, at the same time authorizing production schedules for such producers. The preference rating and allotment number

will also be used for the purchase of Class "B" products and materials other than controlled materials, to be incorporated in his product. Detailed provisions with respect to the use of preference ratings under CMP will be included in regulations to be published.

8. Applications from both prime and secondary consumers are to include *only* the materials required for Class A products, and are not to include materials required for Class B products.

9. The method, forms, application blanks and procedures for obtaining maintenance, repair, and operating supplies, as well as requirements for construction and facilities, are not yet finally decided upon. You will be notified in advance as to where and when to make application for these requirements. In the meantime, follow existing preference rating procedures.

10. In a number of cases, allotments (and accompanying preference ratings and schedules) may be issued on the basis of information already available without requiring an application. If by Feb. 1, 1943, you have not been requested to file an application or received instructions, you may inquire of your Claimant Agency (or your customer if you are a secondary consumer) for specific instructions.

Q.—As a Class B producer, how do I get materials under CMP?

A.—1. Application blanks or other instructions with respect to obtaining allotments of controlled materials will be issued by WPB early in January of 1943. You will be requested to make application for controlled materials required by you and your secondary consumers for delivery during the second quarter of 1943 to meet production schedules approved by the appropriate Industry Division.

2. A manufacturer of a Class B product is *always* a prime consumer. He will make his application to and receive his allotment from the appropriate WPB Industry Division, which, in this respect, acts as an "office" of the appropriate Claimant Agency or Agencies. In special cases only, a Claimant Agency may make an allotment directly to a Class B producer.

3. The producer will issue necessary application blanks to his secondary consumers requesting them to apply for controlled materials needed to meet production schedules approved by him covering the second quarter of 1943.

4. After receiving applications from his secondary consumers, the producer will submit his application to the appropriate Industry Division.

5. The Industry Divisions will then review the applications and will issue allotments, preference ratings, and authorized schedules. This should start early in February of 1943.

6. Upon receipt of his allotment, the Class B producer will place his purchase orders (or modify existing orders by schedule releases) so as to conform with the allotment, preference rating and authorized schedule which he has received. He will use the allotment for purchase of controlled materials and for making further allotments to producers of Class "A" products to be incorporated in his product, at the same time authorizing production schedules for such producers. The preference rating and allotment number will also be used for the purchase of Class "B" products and materials other than controlled materials to be incorporated in his product. Detailed provisions with respect to the use of preference ratings under CMP will be included in regulations to be published.

7. Applications from the B producer are to include *only* the materials required for his Class B products and for incorporated Class A products, and are not to include materials required for other Class B products incorporated in his product.

8. The method, forms, application blanks and procedures for obtaining maintenance, repair, and operating supplies, as well as requirements for construction and facilities,

Materials Plan Explained in Detail

are not yet finally decided upon. You will be notified in advance as to where and when to make application for these requirements. In the meantime, follow existing preference rating procedures.

9. If you have not been instructed by Feb. 1, 1943, to file an application, you should ask for advice from the appropriate Industry Division of the WPB or from your nearest WPB local office. Instructions for filling applications will be made either by specific letter to individual producers or by general orders or regulations referring to specified classes of producers.

Q.—What should my company be doing to insure that its requirements are given proper consideration?

A.—The short answer to this question is that you should do nothing until you are properly advised by the Claimant Agency, either directly if you are a prime consumer or indirectly through your prime consumer if you are a secondary consumer; by the appropriate WPB Industry Division for production requirements if you are a manufacturer of a Class B product or for industrial maintenance, repairs and operating supplies, no matter what you produce so long as your plant is not owned and operated by a Claimant Agency; or by general instructions and regulations now in process of formulation and to be issued by the WPB. The essential point is that the Nov. 2 booklet on CMP now in your hands is neither an administrative order nor a set of instructions. It has been circulated to inform you generally of the character of the change in materials distribution about to be initiated. It will be supplanted by general and specific instructions in ample time for each of you to comply with its essential provisions.

The plan provides that by July 1, 1943, all companies requiring controlled material (that is, steel, aluminum, or copper) will be operating under the plan. Prior to July 1 many companies will of necessity continue to receive their authorizations to purchase materials under PRP. You will appreciate that the transition to the CMP requires an enormous amount of work in perfecting organization and procedures both inside and outside of Washington before definitive answers can be given to the inquiries of each individual company. In this process, many adjustments will be made both in classification and in procedure to adapt the plan to specific problems as they arise.

You are now receiving materials on the basis of PRP authorizations. You will continue to operate under PRP and other established Priority Regulations (subject to modifications which will be made when necessary) until it becomes practical to transfer your operations to CMP.

Q.—In view of the fact that complete operation under CMP will not begin until July 1, 1943, may my company choose to operate under PRP until that time? Until that date, may it refuse to make application or to receive allotments under CMP?

A.—The short answer to this question is "No." Whether a company or a plant will operate under PRP or under CMP or both is governed by administrative regulations as they are approved and issued. Continued operation under PRP during the transition period is provided for not as an alternative to CMP but as assurance against maladjustment while problems of transition are being resolved.

During the transition period, many companies will of necessity receive materials on two different bases: The one in terms of allotments and authorized preference ratings, received either directly from a Claimant Agency or from a WPB Industry Division or indirectly through prime consumers; and the other, in authorizations to purchase under PRP. The company must certify that requests on one basis are not duplicated on the other.

Inventory Order Reported Drafted; Other Difficult CMP Problems Exist

• • • An inventory order for controlled materials has been drafted. It is expected 45 days' supply will be permitted for meeting production schedules, while 90 days' supply of necessary repair and maintenance items will be provided, with 45 days' supply allowed for other repair and maintenance items.

Deliveries which would bring inventories to larger amounts than those indicated are banned under the proposed order, and producers are prohibited from accepting such orders.

Plans are reported being worked out under CMP to permit manufacturers producing the same product for either several claimant agencies or for several prime contractors to pool the material authorized on the allotment number on their contract. This is one of numerous problems which must be ironed out speedily if the CMP timetable is to be adhered to by the government.

The Class B list is reported now to embrace over 6000 items. There is some question as to whether it will be issued in full to the public.

Q.—What is the difference between a Class A and a Class B product under the Controlled Materials Plan?

A.—The WPB will soon release a revised, detailed list of items to be classified as Class B products. This official list will define Class B products under the CMP. All products containing controlled materials not on this list are Class A products.

In general, the reason for placing a product on the Class B list is the method and type of distribution of the particular product. Where a product is distributed through many outlets for use by several or all of the Claimant Agencies it becomes impractical for the manufacturer to receive allotments of controlled materials from each of these outlets for the procurement of materials. The B list was devised, therefore, to centralize responsibility for the compilation of necessary information, the scheduling of production and the issuance of allotments for these products. In each case, this responsibility is placed on the appropriate Industry Division of the WPB which will be the exclusive Government contact for Class B Prime Consumers under the CMP. Only limited exceptions to this rule will be made where one of the services considers it vital to proper scheduling of its output to control particular plants in the manufacture of selected B products. Where an exception of this kind is made, the parties concerned will be specifically notified.

Some items (for example, compressors) have been included in the Class B list for no other reason than that aggregate demand for such products is expected to exceed fabricating capacity. For such products (parts or components of end-products), it was essential that available capacity be pre-scheduled among Claimant Agencies in order that the end-product production schedules of those Agencies could be adjusted to the restricted supply of these scarce components.

The distinction between Class A and Class B products, therefore, defines the contacts and responsibilities of industry to Government Agencies under CMP. Class A Prime Consumers look generally to the Offices of the Claimant Agency which have jurisdiction over their output for specific instructions and for allotments of materials. All Class B consumers look to their appropriate Industry Division. Secondary Consumers always look to their customers. Conceivably, a single manufacturer may be each of

these classes of consumers and separate portions of his output.

The distinction between Class A and Class B products, therefore, is based on the necessity to mold the method of distributing materials to the practical realities of business operations and practices. It has nothing whatsoever to do with the relative importance or urgency of the products themselves. Allotments of controlled materials to manufacturers of Class B products are identical with similar allotments to manufacturers of Class A products. From its very nature, the final classification of products into Class A or Class B will evolve gradually as experience is gained.

Q.—Should my company begin the cumulation of bills of materials on various products manufactured by it against the time when this material may be required under the CMP?

A.—No requests for bills of materials should be initiated by industry and no attention is required to requests that may be received for bills of materials information unless authorized requests for such information are made by a Claimant Agency or by the appropriate Industry Division.

The bill of materials is recognized as but only one basis for determining material requirements. It is frequently more desirable to employ alternative methods. Where the item is manufactured on a mass production basis, and, therefore, accounts in the aggregate for large quantities of critical materials, a detailed bill of materials may be necessary. On the other hand, where manufacture is sporadic and to specification and especially where a miscellaneous group of commodities is produced, either an engineering or manufacturer's estimate or the record of past consumption per unit of output (either actual physical units or dollar value depending upon the character of output) may prove more informative.

The compilation and perfection of bills of materials information are continuing responsibilities of the Claimant Agencies for Class A products and of the WPB Industry Divisions for Class B products. Every effort will be made to hold these requests to a reasonable level, but many of you will be required to supply such information during the months ahead.

Q.—To what government agency should my company make application for industrial maintenance, repairs and operating supplies under CMP?

A.—Your company should make no application for industrial maintenance, repairs and operating supplies under CMP until such time as it has been properly notified by the WPB to submit such requests.

If your plant is owned and operated by a Claimant Agency, you will look to that agency for your maintenance, repairs and operating supplies. Otherwise, you will generally look to that WPB Industry Division which corresponds with your major production classification. Some miscellaneous small industries will receive their allotments and authorizations for this purpose from their WPB Regional Office.

The WPB will issue a regulation governing the distribution of materials and products for this purpose. For some industries it will be necessary to require, at least in the first instance, an application for materials and products for maintenance and repair, together with a statement of past usage. For others, sufficient information is available in the Industry Division to dispense with such an inquiry. In any case, your company will be adequately forewarned if such information is required. Meanwhile, you will continue to receive authorizations under PRP or from the Industry Divisions as heretofore which will enable you to satisfy these vital needs.

Q.—What should my company do in order to obtain authorization under CMP to expand plant or facilities?

A.—The CMP provides that responsibility for new construction and facilities will be placed on the Claimant Agency which benefits exclusively from the output. All cases in which benefit is shared by two or more agencies will be the responsibility of the Industry Divisions except as may be otherwise agreed by the agencies or determined

by the Program Vice-Chairman. Once this basic division of responsibility has been fixed, each Claimant Agency or Industry Division will then decide the extent to which it requires additional information, if any, and the appropriate forms on which such information must be supplied by the prime contractor.

Authorizations for construction and facilities under CMP will be extended for construction in much the same way in which authorizations are extended for production. That is, the prime consumer will be responsible for submitting scheduled requirements information, including such other relevant data as the Claimant Agency may require, on request.

Minor capital additions not exceeding \$500 for any one item may be included under industrial maintenance, repair and operating supplies.

Pending the receipt of contrary advices, industry will continue to employ procedures already developed for receiving authorizations to purchase materials and products for construction facilities.

Q.—What is the relative value of preference ratings and allotment numbers in the purchase of controlled materials and in the purchase of other materials and of products, including parts and sub-assemblies?

A.—In general, an order bearing an allotment number will take precedence over an order not bearing an allotment number irrespective of preference rating, but there are particular qualifications to this generalization for each of the three groups of commodities involved in this question.

(a) *Controlled Materials.* After July 1, 1943, no delivery of a controlled material will be authorized except against an allotment number. Until that time orders bearing an allotment number (or certified to be based on allotment numbers in hand) will take precedence over orders not bearing such numbers irrespective of preference rating.

Among orders bearing allotment numbers, acceptance by the controlled materials producer shall be in the order in which received irrespective of the preference rating which may be associated with the allotment. Since acceptance of an order implies acceptance of the specified delivery date, within the quantitative limits of minimum efficient rolling, deliveries will be adjusted to requested delivery dates on the orders as accepted.

Two minor qualifications may be noted. Where small orders are bulked, the purchaser does not transmit an allotment number to the producer but his order is given equivalent standing by his certification that it is comprised of allotments in hand. And, second, in case of emergency, the production and delivery schedule for authorized orders may be altered by directives issued by a Controlled Materials Branch.

(b) *Other Materials.* Deliveries of such materials continue to be governed by preference ratings and allotment numbers subject to priority regulations and orders of the WPB.

(c) *Fabricated Products.* Orders for fabricated products bearing allotment numbers will take precedence over orders without allotment numbers irrespective of preference rating with one exception: namely, that orders bearing AAA ratings will take precedence over all other orders whether or not they bear allotment numbers.

Orders bearing allotment numbers shall be accepted and scheduled for delivery in the order in which they are received irrespective of preference ratings. Only in the case of unforeseen contingencies arising from factors beyond the control of management, in which promised deliveries cannot be met, will the preference ratings on orders bearing allotment numbers be employed to resolve conflicts. And in this event, deliveries may be directed by the Claimant Agency within schedules subject to its jurisdiction or by the WPB without respect to preference rating.

Where production is scheduled by a WPB Industry Division or, on agreement, by a Claimant Agency, deliveries will, of course, be made in conformity with the directives of the scheduling agency.

It should be emphasized that the foregoing are very general principles as set out in the plan. More specific and detailed provisions will be contained in the regula-

PRIORITIES

tions which will be published before allotments are made to Industry.

Q.—Are preference ratings extendable under CMP?

A.—Priorities Regulations governing the extension of preference ratings under PRP are now being revised. Until that revision is completed, a definite answer to this question cannot be given. The provisions of the plan, however, suggest that the answer to this question is "Yes," except in the case of Class B products and suppliers of controlled materials.

Authorizations to purchase materials other than controlled materials and to purchase fabricated items are issued in the form of preference ratings directly to Prime Consumers under CMP by the Claimant Agencies and by the Industry Divisions. In his purchase of a Class A product, the Prime Consumer must provide his supplier with an allotment of controlled materials and extend to him the authorized preference rating for the purchase of other materials or fabricated items. This supplier, in turn, in the purchase of Class A products, follows the same procedure. Only in this way would the supplier of products made from other than controlled materials be placed in a position to replenish his inventories.

In the case of Class B products, on the other hand, the manufacturer cannot employ preference ratings served

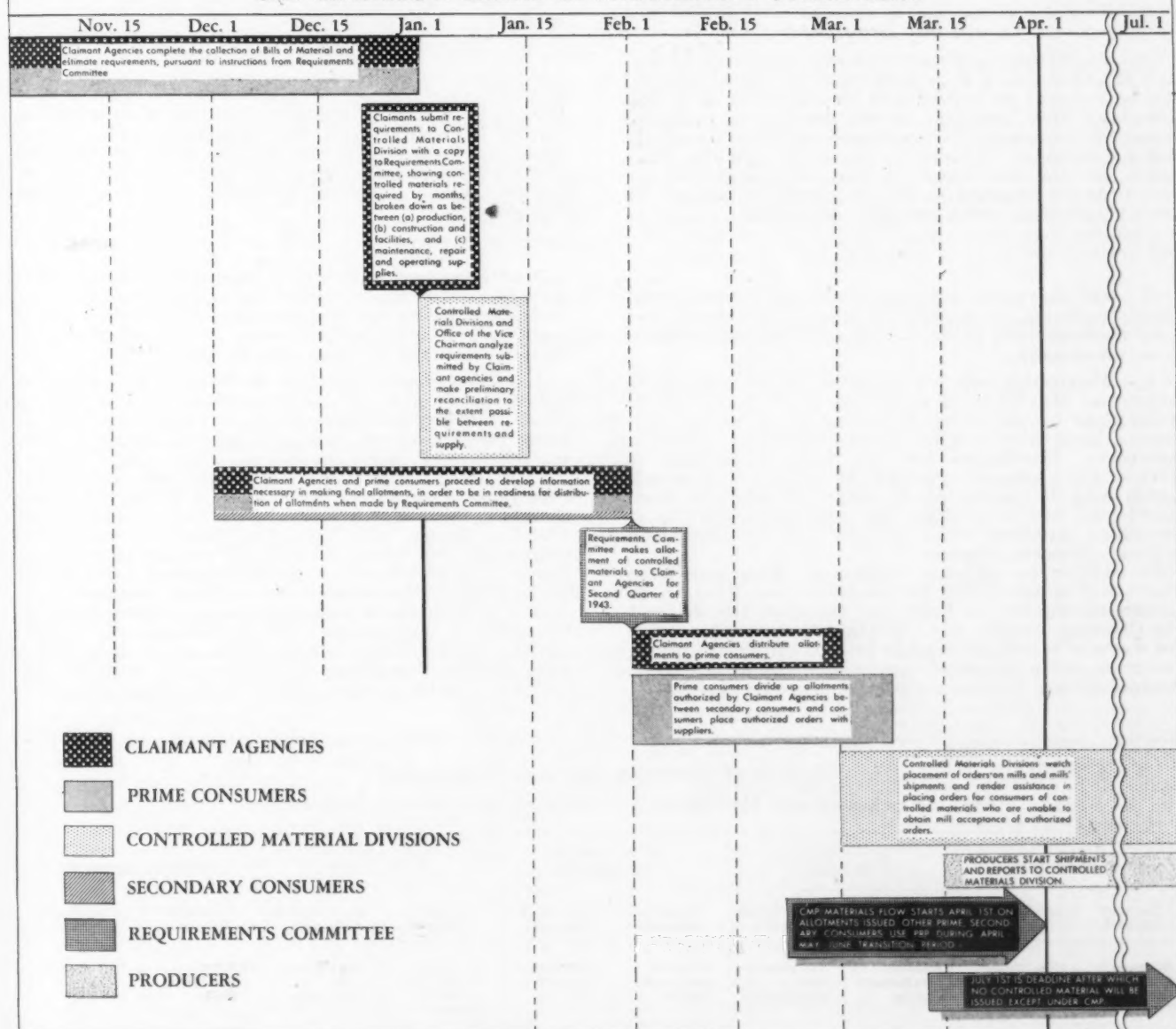
on him in the sale of his product to replenish his inventory of controlled materials. These are authorized to him directly by the appropriate Industry Division of WPB. His use of preference ratings for other materials or fabricated products will be governed by regulations to be announced.

Q.—What assurance is there under CMP that a manufacturer will receive Class B products at the time and in the quantity required by his production schedule?

A.—In the purchase of some Class B products, the output of which may have to be allocated because of a limitation of fabricating facilities, the delivery of the product to the buyer will be governed by directive of the scheduling agency (either Claimant Agency or Industry Division) to the manufacturer. For other Class B products, except for the over-riding AAA rating, the buyer with an allotment number has reasonable assurance from the fact that his order is accepted and scheduled irrespective of preference rating in the order in which it is received and that the seller is not to accept orders which he cannot fill in conformity with the stated schedule.

When fabricating facilities for certain Class B products are the limiting factor, it is anticipated that this will be taken into account in authorizing schedules for end products.

CMP TIME FLOW CHART OF PROGRESSIVE OPERATIONS



PRIORITIES

Q.—Is it necessary under CMP for a manufacturer to identify each purchase order with the allotment number? If so, what provision is made for such purchases of off-the-shelf goods?

A.—It will be necessary to use the allotment number in the purchase either of controlled materials or of parts except where the quantities of controlled materials involved are small. Provision is made in the plan for the bulking of allotments of controlled materials so long as no one of the orders so bulked exceeds 5 tons of carbon steel, 1 ton of alloy steel, 500 pounds of stainless steel, 200 pounds of copper, and 100 pounds of aluminum. In such cases the manufacturer merely certifies to the controlled materials producer that he has unused allotments aggregating the total quantity of material ordered and indicates the distribution of these aggregate allotments among Claimant Agencies. A purchaser of manufactured products whose orders are based on numerous contracts or purchase orders received bearing allotment numbers authorizing him to allot similar small quantities of controlled materials to secondary consumers, may similarly bulk such allotments in his purchases of such products. Finally, provision is made in the Plan for the purchase of controlled materials from warehouses without allotment numbers or end-use identification where these purchase orders do not exceed monthly quantities which are now in process of determination by the respective Controlled Materials Branches. All these matters will be covered more specifically in the regulations.

Q.—What size of inventory of materials or of finished parts or products will be permitted under CMP?

A.—Regulations governing the reporting and the control of inventories will be issued shortly. Inventories will not be reported on applications for allotment. It is contemplated that whenever inventories exceed quantities considered necessary for continued manufacture of the plant's scheduled production, provision will be made either for the cancellation of equivalent allotments received by the company or for the requisitioning and redistribution of its excess unusable inventories.

Q.—Will warehouses order materials from controlled materials producers on the basis of allotment numbers? And what limitations will be imposed on manufacturers' purchases from warehouses?

A.—Warehouses will not apply allotment numbers on orders for controlled materials but their stocks will be maintained by production directives issued by the Controlled Materials Divisions to the controlled materials producers. Regulations are now being formulated to govern the maximum quantity of controlled materials which may be purchased on allotment numbers from warehouses and to establish the maximum quantities of controlled materials which may be sold by warehouses without allotment numbers.

In addition to ordinary warehouses, some warehouse stocks will be earmarked for particular use. That is, on agreement between the Controlled Materials Division and the Claimant Agency, the Claimant Agency may provide for a special warehouse stock to be used by selected manufacturers under its jurisdiction within regulations to be imposed by the Claimant Agency.

Q.—My company manufactures steel castings and steel forgings. How will we obtain production materials under CMP?

A.—Steel castings are a controlled material, as indicated by the fact that they are included on the CMP materials list. As a manufacturer of a controlled material, you will obtain raw materials, such as pig iron and scrap, as heretofore under regulations and procedures set up by the Steel Division. Steel forgings, on the other hand, are not included on the CMP materials list and are therefore manufactured products under CMP. You will therefore receive allotments of steel for forgings in bar, bloom or billet stock as you may require, from the buyers of your forgings, either Class A or Class B producers. In short, for steel forgings, you are a Secondary Consumer.

Q.—My company uses steel products in many forms: Castings, forgings, bolts and nuts, nails, sheets, tubing, etc. In what units should it report its steel requirements under CMP?

A.—Among the products listed, these which are on the CMP materials list, namely, castings, nails, sheets and tubing, are controlled materials. You should report your requirements for such steel products in the weights in which they are purchased by you for use in manufacturing (except that castings should be shown in rough weight before machining). On the other hand, forgings and bolts and nuts are manufactured products. Bolts and nuts, as a Class B product, would not be included in your application for a steel allotment at all. For them, you will receive an authorized preference rating with your allotment of controlled materials which you may employ in purchasing your requirements. Since forgings are not on the B list, your steel requirements for this product (which you will collect from your supplier and must allot to him in turn) should be expressed in the quantities of bar stock or forging blooms and billets from which the forging is manufactured. The manufacturer of the forgings must receive from you, the purchaser, an allotment of steel equal to the rough stock required for their manufacture, including processing losses, rejections, spoilage and so forth.

Q.—My company manufactures railroad locomotives, repair parts for locomotives, M-4 tanks, and certain components from tanks assembled by other manufacturers. How would it procure authorizations for production materials and for industrial maintenance, repair and operating supplies under CMP?

A.—This company is a Class A Prime Consumer to the extent that it manufactures locomotives and M-4 tanks, a Class B Prime Consumer in its manufacture of repair parts for locomotives, and a Secondary Consumer in its manufacture of tank components.

a) Railroad locomotives are one of the very few civilian-type Class A products. As a Class A Prime Consumer, therefore, this company might be required to provide each Claimant Agency with Bills of materials or material requirements for locomotives to be purchased for that Agency. In fact, however, the Transportation Equipment Division of WPB probably has sufficient information to enable it to compute requirements for various types of locomotives. The actual production scheduling of locomotives under CMP is left to the Transportation Equipment Division; but allotments of controlled materials and authorizations to purchase other materials and manufac-

Sources of Allotments and Authorizations for Controlled and Non-Controlled Materials for Different Purposes

"A" PRODUCTS		"B" PRODUCTS (With Schedule)		"B" PRODUCTS (Without Schedule)		CONSTRUCTION AND FACILITIES		OPERATING SUPPLIES	
Controlled Materials	Non-Controlled Materials	Controlled Materials	Non-Controlled Materials	Controlled Materials	Non-Controlled Materials	Controlled Materials	Non-Controlled Materials	Controlled Materials	Non-Controlled Materials
Allotment from Agency	The schedule is the authorization	Allotment from Industry Division	The schedule is the authorization	Allotment from Industry Division	Authorization on PD-25-A (Revised)	Allotment from Agency or Industry Division	The schedule is the authorization	Allotment from Industry Division	Authorization on PD-25-A (Revised)

CMP Not Formally Established; Five Claimant Agencies Added

••• No formal order has been issued establishing the Controlled Materials Plan, but it is thought at Washington that WPB will remedy this defect before long. Meanwhile, WPB is going ahead issuing instructions and making adjustments. Claimant agencies are preparing detailed instructions to prime contractors.

Five claimant agencies will be added under CMP. They are the Office of Defense Transportation, the Agricultural Department, the Office of Petroleum Coordinator, the Office of the Rubber Director, and the National Housing Administration.

tured goods required in locomotive production will be provided by each Claimant Agency (including the Industry Division acting for the Office of Civilian Supply) in conformity with the production schedule established for that Claimant Agency.

b) *M-4 Tanks.* As a Prime Consumer, this company will be responsible to the War Department for the submission of bills of materials on forms CMP 1 and 3 (2 if required). It will also make application when necessary for controlled materials for itself and its subs for items other than Class B products needed to meet the production assigned to it by that Agency. It will receive allotments of materials from the War Department for this purpose.

c) Repair parts for locomotives are Class B products and in the manufacture of such, the company will make any necessary applications to and receive allotments from the appropriate WPB Industry Division.

d) In the manufacture of components for tanks, this company is a secondary consumer and as such it will be responsible to the purchasers of those parts to supply either bills of materials or requirements information as requested. It will receive from such purchasers allotments of materials against their procurement schedules.

e) For maintenance, repair and operating supplies, this company would apply on a plant basis (if an application is found to be necessary) to the Industry Division of WPB under which its major activities are classified. It would receive allotments of controlled materials and authorizations to purchase other materials and manufactured products for maintenance, repair and operating supplies from that Division.

Q.—Since the manufacturing cycle for my company's product extends far beyond three months, it is necessary for us to schedule production and place orders for a much longer period in advance than is provided for by quarterly allocations under CMP. What provision is made for companies such as ours under CMP?

A.—Although CMP provides for a quarterly allocation of materials among Claimant Agencies, it also permits each agency to allot materials for subsequent quarters up to 80 per cent of its quarterly allotment during the first succeeding quarter, 60 per cent during the second, and 40 per cent in each quarter thereafter.

This makes it possible for any Claimant Agency to take care of the needs of a company with a long production cycle. Within these aggregate limits, the Agency may make firm allotments up to 100 per cent of any given

company's requirements over an indefinite period in advance.

In the absence of such future allotments, there is nothing to prevent any company from placing orders with the mills in advance of the quarter for which it has received allotments. Such orders, however, must be supported by actual allotment numbers before delivery by the controlled material producer can be made.

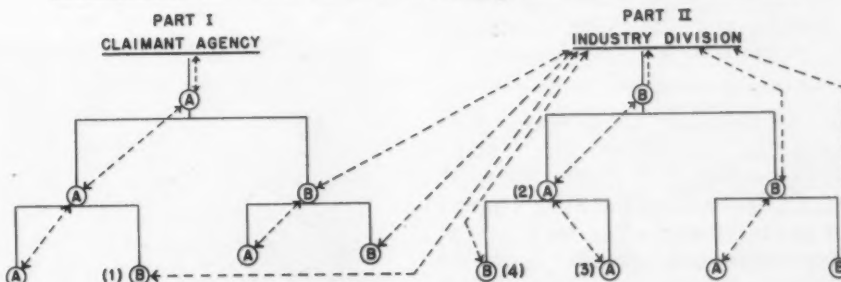
Q.—Assuming that the quantity of controlled materials allotted to my company is inadequate for us to meet our fixed production schedule, does CMP provide for supplementary allocations such as those on PD-25F under PRP?

A.—No form for supplementary allocations is provided for in CMP. Wherever allotments are inadequate to meet production schedules, however, the manufacturer should take up the matter either directly with his Claimant Agency or Industry Division if he is a Prime Consumer or with his Prime Consumer if he is a Secondary Consumer. In the former case, the Claimant Agency may be able to provide additional materials either from contingency reserves set aside for this purpose or by reducing allotments made to other prime consumers. In the latter case, if the Prime Consumer is unable or unwilling to adjust the allotment, appeal may be taken to the Claimant Agency since the failure to supply such materials may jeopardize the achievement of the production schedule on which the overall allocation has been made. In either case, the production schedule or the allotment or both must be adjusted.

Q.—Are gages, jigs, machine tools, etc., required for particular contract to be considered production requirements? If not, how should they be classified?

A.—The fact that an operating supply or an item of capital equipment is required for a particular contract does not change in any respect its proper classification. Jigs and gages, therefore, remain operating supplies irrespective of whether they are required for one or many contracts; and machine tools (unless the value is under \$500 and, therefore, classifiable as operating supplies) are facilities to be classified under new construction and facilities.

FLOW OF BILLS OF MATERIALS, APPLICATIONS, AND ALLOTMENTS UNDER THE CMP PLAN



EXPLANATION OF CHART

A in circle—Manufacturer or producer of "A" products. He may be either a Prime or Secondary Consumer of controlled materials. For example, in Part II of the chart, the manufacturers or producers of "A" products who are numbered (2) and (3) are Secondary Consumers of controlled materials.

B in circle—Manufacturer or producer of "B" products. He is a Prime Consumer of Controlled Materials. Even though a "B" product producer is a Prime Consumer because he gets his allotment directly from an Industry Division, he may be a Sub-Contractor because he sells his product to another manufacturer. For example, in Part I of the chart, the manufacturer of "B" products who is numbered (1) and in Part II the manufacturer numbered (4) are both Prime Consumers of Controlled Materials but are Sub-Contractors to other manufacturers.

In general:

1. Each manufacturer or producer of "A" products, whether a Prime or Secondary Consumer of controlled materials, will apply to, and receive allotments for controlled materials from, the Agency or Consumer to whom he sells his product.

2. Each manufacturer or producer of "B" products, will apply to, and receive allotments for controlled materials from, the appropriate Industry Division.

PERSONALS

• **William C. Carter**, for 14 years vice-president and for the past year executive vice-president, has been elected president of Link-Belt Co., Chicago, effective December 31, to succeed Mr. Alfred Kauffmann, who has resigned because of ill health. Mr. Carter, a mechanical engineering graduate of the University of Illinois, joined the Link-Belt Pershing Road Chicago plant organization in 1902 as a draftsman. He has consecutively held the positions of engineer-



WILLIAM C. CARTER, president of the Link-Belt Co., Chicago.

ing department supervisor, construction superintendent, plant superintendent, plant general manager, vice-president in charge of production. He has been executive vice-president in complete charge of company affairs since Mr. Kauffmann's illness.

• **D. P. Brannin**, who has been in charge of metal sales for the New Jersey Zinc Sales Co. in the Chicago area, has been appointed district sales manager of the pigment and metal sales divisions, with headquarters in Chicago. **J. P. Dunphy**, of the New York sales department, has been named district sales manager, pigment division, with headquarters in New York. Before joining the New Jersey Zinc Co. in 1913, Mr. Brannin was associated with gold mining and milling concerns in Colorado.

Mr. Dunphy has been associated with the company for almost 25 years. He was chief clerk of the sales department in New York until 1922, when he took over many sales accounts in the New York area.

• **R. E. McDonald** has been appointed advertising manager of the Dumore Co., Racine, Wis., in place of **R. B. Voelker** who will soon be in uniform. Mr. McDonald was formerly assistant to the advertising manager and editor of the house organ of Fairbanks, Morse & Co., Chicago.

• **Rudolph B. Flershem**, formerly general manager of the Buffalo Bolt Co., has been elected president and **Raymond K. Albright**, president since 1931, has been elected chairman of the board.

• **Walter H. Gebhart** has been appointed domestic sales manager of Henry Disston & Sons, Inc., Philadelphia. Mr. Gebhart has been with the company 33 years, 15 of which have been with the sales department.

• **Robert H. Bishop**, formerly eastern sales manager of the lighting division of Sylvania Electric Products Inc., has been appointed general sales manager of this division. Mr. Bishop takes over from Charles G. Pyle, who recently resigned to accept an appointment as managing-director of the Na-



ROBERT H. BISHOP, general sales manager of the lighting division of Sylvania Electric Products, Inc.

tional Electrical Wholesalers Association.

• **M. E. First**, formerly chief engineer of C. O. Bartlett & Snow Co., Cleveland, has been appointed director of the foundry equipment department and **Henry A. Christy** has been elected to membership on the board of directors. Mr. First is a director of the company and has been chief engineer for the past 22 years. Mr. Christy joined the Bartlett & Snow Co. as production clerk a few days after his graduation from Case School of



M. E. FIRST, director of the foundry equipment department, C. O. Bartlett & Snow Co., Cleveland.

Applied Science in 1923 and has risen steadily in the company, having been made assistant production manager in 1925, production manager in 1928 and superintendent in 1936.

• **W. L. Buchanan** has been appointed field manager of renewal parts sales of the Crocker-Wheeler Mfg. Co. with headquarters in the Chicago office. Mr. Buchanan had been a service engineer for the Westinghouse Electric & Mfg. Co. in the Chicago area, specializing on commutation difficulties. In 1933 he was appointed appraisal engineer of the Missouri Public Service Commission and subsequently returned to Westinghouse as installation engineer of automatic substations for the IRT, New York, following which he became interested in steel mill work and supervised the installation of

electrical equipment on the hot strip mill of the Bethlehem Steel Corp. at Sparrows Point, Md.

- **F. L. Hopkinson** was appointed a vice-president of Willys-Overland Motors. He has been with General Motors during the past 17 years in its overseas and domestic divisions.

- **D. R. Guthrie** has been appointed personnel manager of the Ward Leonard Electric Co., Mount Vernon, N. Y.

- **Charles J. Otis** has been placed in complete charge of purchases for the Ward Leonard Electric Co., Mount Vernon, N. Y.

- **Raymond S. Livingstone** has been elected vice-president in charge of personnel of Thompson Products, Inc., Cleveland. The new vice-president will continue in his capacity of directing employment, industrial training, labor relations, employee publications, and the social and athletic activities of employees.

Mr. Livingstone started with Thompson Products in 1929 as publicity manager. Prior to becoming director of personnel he held successively positions as manager of the traffic marker division, sales engineer, manager of the piston division, and Cleveland plant personnel manager.

- **E. A. Seeley**, manager of field personnel and training for the B. F. Goodrich Co., has been loaned to the Army Ordnance Department's Tank and Automotive Center, Detroit, as executive personnel advisor.

- **W. R. Hucks**, manager of the raw materials division of B. F. Goodrich Co., will be assigned to the operating division of the Rubber Reserve Co. He joined B. F. Goodrich in 1926 as a compounder in the tire division, went to the California plant in 1928 as chief chemist, later becoming technical manager of the Pacific division. He returned to Akron in 1938 to take over his present work.

- **H. W. Hem** has joined the Howe Scale Co. as research director. After 11 years with the Strait Scale Co., Mr. Hem went to the Toledo Scale Co. In 1929, he became chief engineer at Toledo, from which position he resigned to join the Howe Scale Co., at the factory in Rutland.

OBITUARY . . .

- **John J. Hebor**, small tool and gage manager of the Cleveland office of the Pratt & Whitney Division of Niles-Bement-Pond Co., Hartford, died Dec. 2. He was 50 years old. Going to Pratt & Whitney in Hartford in 1909, he worked in the various departments of the small tool division until 1915. In that year he was transferred to the Pratt & Whitney Cleveland office. In a few years he rose to become manager of small tool and gage sales in that office.

- **David S. Youngholm**, vice-president of the Westinghouse Electric & Mfg. Co. in charge of the company's lamp division, Bloomfield, N. J., died recently from a sudden heart attack. He was 53 years old. Immediately after leaving school in 1909, Mr. Youngholm joined the Westinghouse Lamp Company in Bloomfield. He was transferred to the stock and statistical department and then to the sales department, with headquarters at different times in Chicago, Kansas City and St. Louis. He was placed in charge of production with headquarters at Bloomfield in 1920. In 1923 he became assistant manager of sales and in 1924 was made assistant general superintendent. He became assistant to the vice-president of the lamp company in 1930. Three days before the reorganization of the Westinghouse Lamp Co. as the Lamp Division of the Westinghouse Electric & Mfg. Co., Mr. Youngholm was made vice-president of the latter company.

- **William C. Tamplin**, special representative, sheet sales, Carnegie-Illinois Steel Corp., died at Pittsburgh last week, aged 66 years. Mr. Tamplin had been associated with the Carnegie-Illinois Steel Corp. and predecessor companies for 42 years, entering the employ of the Farrell-Mercer works, American Sheet & Tin Plate Co., in 1900.

- **Hugh Purdy**, Pratt & Whitney's representative in England, died Dec. 3. Mr. Purdy served his apprenticeship at Pratt & Whitney in Hartford, Conn., starting in 1893. He worked at the Hartford company until 1900 when he was sent abroad to join Mr. Pratt at the famous Paris Exposition. Eventually Mr. Purdy established himself in England with Buck &

Hickman, Ltd., who were and still are agents for Pratt & Whitney as well as several other American manufacturers. He maintained this connection until his death.

- **William Gordon Robinson**, who served as superintendent of ore mines for the Tennessee Coal, Iron & Railroad Co., Birmingham, in the early 1890's and who helped open and develop a number of mines in the Birmingham area, died Dec. 8 at Birmingham, aged 74 years.

- **Thomas J. Santry**, vice-president of the Peerless Machine Co. and a member of the firm for about 24 years, died recently aged, 48 years. He had served as purchasing agent and assistant secretary prior to becoming vice-president of the firm.

- **Norman William Swenson**, a production test pilot for Bell Aircraft Corp. of Buffalo, and **Ralph Milani**, assistant chief test pilot at Fleet Aircraft Corp., Fort Erie, Ont., were killed Dec. 7 when a Bell P-39 and a Canadian Fairchild-Cornell trainer collided 3000 feet above the Fleet plant. Mr. Swenson was Chicago sales engineer for the Imperial Die Casting Co. from 1938 to 1941. He joined Bell last July with 1200 flying hours as a commercial pilot.

- **William Wood**, former superintendent of the Gray Foundry Co. of Cincinnati, died at his home last week. He was 76 years old and had been an executive of the foundry company for 40 years. He was born in Scotland and came to the United States when he was 18 years old.

- **Roy C. Herrlich**, secretary of the Detroit Reamer & Tool Corp., died Dec. 10 at his home in Detroit, aged 50 years. Since coming to Detroit in 1926 Mr. Herrlich had been affiliated also with the Norge Division of Borg Warner Corp. and had served on the advisory board on tools in Washington.

- **Adolph L. DeLeeuw**, vice-president and director of Goss & DeLeeuw Machine Co., New Britain, Conn., died Dec. 5.

- **Roger Sherron**, president of the Harrington Co., Philadelphia, died Nov. 21.

The Iron Age Critical Tool Locating Chart

Compiled from latest WPB data on available machine tool capacity.

CRITICAL TOOLS	REGIONAL OFFICES—WAR PRODUCTION BOARD											
	Total	No. 1 Boston	No. 2 New York	No. 3 Phila- delphia	No. 4 Atlanta	No. 5 Cleveland	No. 6 Chicago	No. 7 Kansas City	No. 8 Dallas	No. 10 San Francisco	No. 11 Detroit	No. 12 Minne- apolis
BORING												
Horizontal—3" Bar	50,622	7,215	8,652	5,709		10,740	6,614	1,424	925	2,658	5,937	748
" —To 4" Bar and Over	65,613	6,056	5,689	9,868		22,622	6,371	3,533	2,168	4,288	3,837	1,181
Vertical—54"	39,358	4,061	5,909	5,153		8,803	4,968	4,390	985	1,210	2,010	1,871
" —To 84"	56,333	4,166	5,780	6,743		14,119	5,474	4,359	3,587	5,262	2,241	1,602
" —To 120"	20,370	4,274	2,574	2,017		5,476	1,975	1,481	465	774	1,042	292
" —Over 120"	5,507		879	1,428		1,685	664	346	37	180	120	168
Jig Borers	34,376	4,866	8,373	2,956		5,350	4,315	964	158	2,784	4,351	258
Misc. Precision—Heald—Ex-Cell-O type	21,510	1,794	887	1,072		7,647	3,969	1,511	120	2,328	1,954	228
BROACHING	86,606	16,003	12,566	5,901		17,758	14,186	2,855	336	4,403	10,665	1,933
DRILLING												
Radial 6" to 8" Radius	74,358	7,062	7,917	10,906		22,849	8,319	5,049	3,614	3,064	4,222	1,356
Over 8" Radius	4,168	162	178	1,186		378	96	120	1,976		72	
DUPLICATING AND PROFILING	36,451	13,311	9,294	3,605		4,066	2,879	225		1,506	1,367	138
FORGING												
Drop—Hammer—Board 100 lb. up	127,279	40,242	35,225	10,090		21,466	10,278	1,082	642	1,670	5,536	1,048
Steam 5000 lb. up	20,177	2,480	4,197	1,289		4,531	903		158	172	5,379	1,068
Press—Forging—Steam Hydr. 500 ton	7,879	1,204	1,754	72		2,411	1,818	216		68	336	
GEAR CUTTING												
Gear Hobbers—48" and up	25,537	2,758	1,984	3,192		7,522	2,732	1,906	686	927	3,451	385
Bevel Gear Cutters	53,260	11,836	4,283	7,214		14,133	6,687	1,800	720	2,018	1,742	828
GRINDERS												
Centerless	37,901	8,748	4,531	3,092		6,169	5,697	2,154		1,681	5,721	108
External Cyl.	452,049	109,357	77,570	39,822		63,662	50,932	23,911	5,737	23,455	42,204	14,699
Internal Cyl.	162,301	30,185	24,607	13,087		21,346	20,617	12,307	5,553	12,707	17,197	4,695
Thread	6,898	1,283	888	681		1,995	184		168	835	864	
LATHES												
Engine—24" Dia.—Over 60" c.-c.	232,560	34,006	38,142	30,614		46,496	24,565	15,140	11,137	14,290	947	8,700
" —Over 24" Dia.—To 60" c.-c.	88,975	14,249	15,157	9,029		16,576	11,059	8,455	4,798	4,092	3,618	1,942
" —Over 24" Dia.—To 96" c.-c.	150,293	20,208	23,174	16,667		32,769	13,748	16,275	6,209	10,922	7,241	3,080
" —Over 24" Dia.—Over 96" c.-c.	372,181	53,341	51,072	54,924		73,831	28,223	34,203	19,720	34,939	14,592	7,336
Turret—12" Dia. 2 1/2" Bar and up	119,525	15,904	27,308	12,801		24,974	11,639	4,334	8,480	2,147	9,768	2,176
" —To 24" Dia. 2 1/2" Bar and up	187,838	24,212	31,438	20,370		36,928	19,066	14,681	6,939	17,773	11,113	5,318
" —Over 24" Dia. 2 1/2" Bar and up	44,283	3,865	6,350	6,602		7,767	6,306	3,877	2,649	4,348	1,623	896
Automatic—12" Diameter	19,082	2,509	3,647	664		851	6,851	1,138	336	388	2,540	158
" —To 24" Diameter	16,034	2,673	2,418	1,008		1,904	1,541	402		4,691	336	1,061
" —Over 24" Diameter	2,147		408	48		168	1,473					
SCREW MACHINES												
Automatic—Single 1"	71,957	17,246	21,101	7,783		11,263	8,984	1,686	124	256	3,978	436
" —Single to 3"	82,275	17,534	12,096	9,296		16,979	14,929	3,178		4,153	3,809	300
" —Single—Over 3"	20,269	3,329	2,828	2,192		2,202	7,646	60		851	1,101	60
" —Multiple—To 3/4"	6,531	684	700	600		592	312				3,643	
" —Multiple—To 1"	101,339	20,726	18,890	10,987		15,840	15,409	2,726		1,822	14,303	636
" —Multiple—To 3"	79,029	11,865	12,036	10,225		16,400	13,854	3,426		2,267	7,711	1,245
" —Multiple—Over 3"	3,235	1,029		116		884	350				644	212
MILLING												
Standard Type—Horizontal—No. 3	247,467	43,980	43,883	22,017		45,352	29,510	14,324	6,957	14,940	19,552	6,952
" —Horizontal—Over No. 3	121,506	15,392	19,374	17,906		25,118	9,776	6,879	3,935	10,445	9,885	2,796
" —Vertical—No. 3	50,680	14,119	7,684	3,165		9,000	5,428	1,418	392	2,348	6,729	397
" —Vertical—Over No. 3	49,248	13,872	3,905	6,819		9,529	4,918	1,063	522	2,301	5,508	511
Mfg.—Horizontal—12" table width	34,871	11,154	8,410	1,302		4,111	5,240	944	120	1,041	1,711	838
" —Horizontal—Over 12" table width	20,841	2,710	1,822	969		1,111	5,240	732		1,331	1,973	421
Planer—Over 30" table width—slab mill	8,616	2,450	1,494	726		5,632	5,251	496		46	272	384
" —Over 30" table width—side spindle	2,745	360	158	909		185	231	144		128	366	264
" —Over 30" table width—vert. spindle	7,012	1,796	1,304	1,004		1,047	415		158		674	614
" —Over 30" table width—side and vert.	10,589	2,290	950	947		3,375	1,671	192		268	695	201
Misc. and Dia. Cutting—Heller Type	22,007	6,605	6,455	1,400		3,872	1,374	316		786	1,199	
PLANERS												
60" wide to 15'	14,297	1,114	2,139	2,169		3,477	1,828	1,094	1,066	476	850	84
60" wide, over 15'	5,772	720	562	880		974	767	604	304	413	380	168
Over 60" wide to 15'	3,648	506	619	1,054		726	168	202	37		144	192
Over 60" wide, over 15'	8,939	783	1,279	1,400		4,130	472	258	112	105	232	168
THREADERS												
External Mills	31,223	7,171	3,468	3,282		4,550	3,154	952	368	3,235	3,836	1,207
Internal Mills	3,173	162		417		902	1,140	216	336			
TOTAL AVAILABLE HOURS.....	3,628,740	645,628	595,008	397,375		695,478	417,376	209,042	102,862	213,140	271,472	81,360

The available critical tool hours per week here shown are based on a 168-hour week and represent usable tool hours subject to operating labor available. Reports are based on initial inspection of the plants concerned by engineers trained for this work. The War Production Board Field Offices are acting as clearing houses for all public or private contractors or agencies interested in using these facilities. These records are revised and reissued *weekly*.

When making inquiries regarding the availability of these critical tool hours for specific jobs, communicate in detail with the Regional Supervisor, Critical Tools Service, in the WPB Region best located for your job. They are:

Region	Supervisor	Assistant	WPB Office
No. 1 Boston	Deane Freeman	H. C. Woodsum	17 Court Street
No. 2 New York	P. J. Lahny	C. Philippi	122 E. 42nd Street
No. 3 Philadelphia	C. E. Reinicker	R. V. Hilands	1617 Penn. Blvd.
No. 5 Cleveland	C. J. Perrier	C. R. Griffith	Union Commerce Bldg.
No. 6 Chicago	S. C. Bloom	W. I. Buhl	20 N. Wacker Drive
No. 7 Kansas City	W. A. Crooks	M. L. Blessing	Mutual Interstate Bldg.
No. 8 Dallas	W. E. White		4th Fl. Fidelity Bldg.
No. 10 San Francisco	M. Brookman	S. W. Liftchild	1355 Market Street
No. 11 Detroit	R. O. Cunningham	J. B. Shepard	7310 Woodward Avenue
No. 12 Minneapolis	E. H. Pitney		334 Midland Bk. Bldg.

The more specifically a need is defined as to hours required, tolerances and deliveries, the more accurately can WPB Field Staff report to you on availability and fitness of facilities wanted.

MACHINE TOOLS

... Sales, Inquiries and Market News

Dealers Must Supply Data for Renegotiation

Cleveland

• • • The request for detailed information concerning machine tool sales in the past for reports by manufacturers that will be made up for renegotiation of government machine tool contracts is causing a great deal of headaches among dealers and builders. For example, one builder has requested of all his dealers the names of customers, items purchased, price charged by the dealer, manufacturer's price, and the separation of orders according to whether they were destined for Defense Plant Corp. plants or were orders of other governmental agencies.

This information was asked for the past two years, 1941 and 1942, and will require of dealers a great deal of time and personnel to check back to make such detailed tabulations. It was estimated that 90 per cent of the original orders from dealers as they came in during the past two years did not have sufficient detailed information for the manufacturer to make the tabulations, and it would be necessary for the dealer to supply the information. In many cases, where the dealer did not have the information himself when the order was placed, it will be necessary for the dealer to go back to the customer himself to obtain the data required by his manufacturer.

With the volume of machine tools sold during the past two years by the many manufacturers, it is almost impossible to obtain all of the data requested, and before final reports are completed practically every company that bought, sold, or manufactured a machine tool will be going back through records to complete the reports.

Cancellations Being Replaced

Cincinnati

• • • The district machine tool market shows no interesting feature during the present week. Management continues to wrestle with the problem of renegotiation of contracts which the local Price

Adjustment Board is attempting to complete within the current fiscal year.

New business continues to flow into the market but not at the brisk pace that has marked earlier ordering. By and large the industry indicates that its backlog at the present time, so far as this area is concerned, is averaging approximately eleven months to a year. Cancellations which have been coming into the market during the last quarter have, of course, tended to ease up the backlog, but manufacturers now report that a fair quantity of cancelled orders have now been replaced on the books, thus insuring capacity production well into the third quarter of 1943.

Personnel problems have not diminished any, but manufacturers indicate a reasonable cooperation with some draft officials in maintaining key men in essential production.

Ford Motor Making Aac-Aac Directors

Detroit

• • • Ford Motor Co. revealed that it is in production on parts and assemblies for anti-aircraft gun directors.

All rooms in which these ma-

chines progress to completion are air-conditioned, so no dust or dirt may get into delicate gears to upset accuracy. The tolerance allowed is .0001 in.

A large proportion of the help employed in this department consists of women, said by supervisory help to be able to accomplish the delicate jobs involved generally more capably than could men.

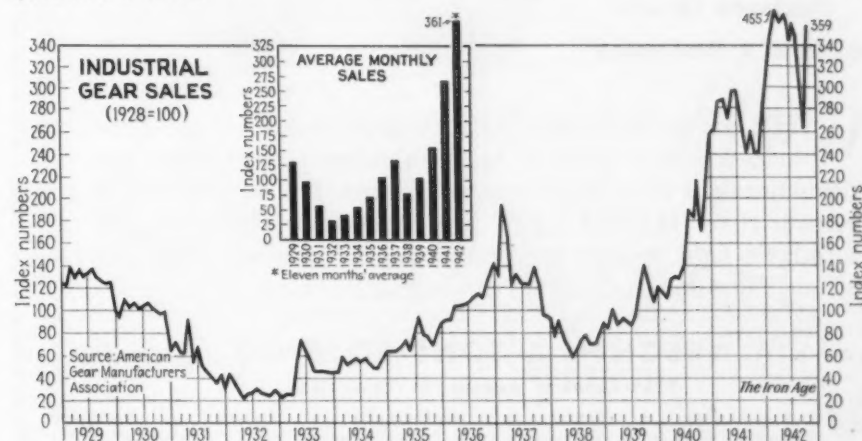
Vultee's New Allentown Plant Gets Bomber Contract

• • • Tom M. Girdler, chairman of Vultee Aircraft, Inc., and its associated company, Consolidated Aircraft Corp., has announced that production of torpedo bombing planes for the United States Navy will start at Vultee's Allentown, Pa., plant as rapidly as aircraft facilities are completed. This will be hastened through WPB's arrangement for the conversion of one of the Mack motor truck plants in that city. Contracts for planes at the new eastern project will total well over \$100,000,000.

When the new bomber plant is in full operation in 1943, Vultee expects to have several thousand employees at the division, half of them women. About half of the work will be sub-contracted through suppliers in the East and Middle West.

Industrial Gear Sales Rose in November

• • • Sales of industrial gears during the month of November rose 36½ per cent above the October figure, according to the American Gear Manufacturers Association. The November figure is 49 per cent above the corresponding month of 1941. For the eleven months of 1942 sales were 32.6 per cent higher than they were in the same period last year. The index figure does not include production of automotive gears or gears used in high speed turbine drives.



NON-FERROUS METALS

... Market Activities and Price Trends

Year's Production

Summarized by WPB

••• A brief summary of 1942 production facts on non-ferrous metals is included in the WPB's new booklet, "War Production in 1942." Most of the information is already well known. Included, however, are the following interesting facts and conjectures:

Copper—U. S. supply was increased to nearly 3,000,000 tons in 1942, greater than the entire known world output in 1939. It is hoped that the finishing of Army construction jobs in mining areas in the near future will alleviate the labor shortage. Scrap collection was the source of more than 600,000 tons of refined copper during the year. Increase of imports depends on the course of the war and on shipping facilities.

Zinc—Forty-eight projects recommended by the zinc division of

WPB have been put into construction. They include development and exploitation of new ore deposits, opening of new mines, mills, smelters and refineries. One new smelter was completed and four electrolytic refineries with annual capacity of 216,000 tons were put into operation. Through the BEW, imports of South American and Canadian ores were stepped up. "The central problem in zinc supply at this time is continuing supply of ores. . . . The U. S. faces the second year of war with uncertainty as to the adequacy of its future zinc supply."

Tin—Present plans are to expand the Longhorn Tin Smelter to a capacity of nearly 100,000 tons a year. Efforts to recover tin from cans are expected to provide more than 5000 tons of tin a year. (Both of these statements are highly doubtful.)

Aluminum—One of the most

Republic Denies

Waste of Alloys

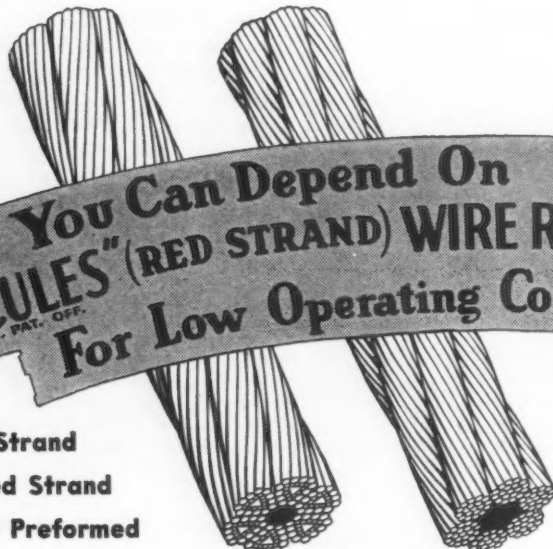
••• Philip Murray, president of the CIO, is reported to have charged before the Senate Small Business Committee that U. S. Steel Corp. and Republic Steel Corp. are wasting nickel and other alloys in making armor plate. Republic denied the charge in a wire sent to Senator James E. Murray, chairman of the committee, on Saturday. The wire called the accusation "without foundation" and suggested that facts in possession of the War Department and the WPB be made available to the committee.

significant developments of 1942 in aluminum production was the conversion of alumina plants to low-grade domestic bauxite and the construction of new plants to use the low-grade ore. The U. S. will be completely independent of foreign-ore imports by May of next year and by September will be able to supply Canada's bauxite needs as well. During 1942, eight new ingot aluminum producing plants came into operation with a total rated capacity of more than 1,000,000,000 lb. Expansion of fabricating facilities is under way but they will not catch up with aluminum production until well into 1943. Labor shortage has become a pressing problem.

Magnesium—The month before Pearl Harbor, U. S. magnesium production was at the rate of 42,000,000 lb. a year. At the close of 1942, production is at the rate of 260,000,000 lb.

A program to raise U. S. production well over 600,000,000 lb. per year is well under way. Eight plants in this program, with a rated capacity of 324,000,000 lb. per year, came into production in 1942. These plants ranging from annual production of 10,000,000 lb. to over 112,000,000 each, already in partial production, were scheduled to come into full production during the early months of 1943.

The outstanding technological development of the year in mag-



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NON-FERROUS METALS

nesium was the ferro-silicon process for extracting magnesium in commercial volume. Dolomite, a plentiful raw material, is reduced in a gas or electric furnace, the magnesium condensing in the form of pure metal. Less electric power is required and construction of the plants takes less critical materials than other types. Enough magnesium is in sight to meet military needs for the duration.

Lead—U. S. supply of lead at the end of 1942 was at the rate of 1,308,000 tons a year, contrasted with a rate of 1,339,000 late last year. About 350,000 tons was recovered from scrap, a decline of about 10 per cent from 1941. It is the one important metal in which a critical shortage does not exist.

Jones Reports on Premiums And Idle Stock Purchases

• • • Metals Reserve Co. has paid out \$12,573,000 in premiums for over-quota production in copper, lead and zinc, Jesse Jones, Secretary of Commerce, reported last week. This is the first figure on quota payments which has been given out since the program began early in the year. No breakdown for the three metals was given, but it is known that lead producers received very little and copper received the most.

Mr. Jones also reported that of the \$720,000,000 which has been allotted for acquisition of idle materials in partly and entirely fabricated forms, only \$8,232,000 has so far been disbursed. These materials include aluminum, copper and brass, iron and steel scrap and tin and ferro-alloys.

New Jersey Zinc Issues Die Casting Movie, Book

• • • As an educational project, New Jersey Zinc Co. last week published a book and released a motion picture on die casting. Both the picture and the book cover die casting in aluminum, magnesium, copper, lead and tin alloys, as well as zinc.

The picture, which is designed primarily for college engineering students, illustrates in color the making of dies, the development and testing of alloys, the equipment and various steps in casting, and some of the uses to which die

cast products are put. One interesting shot shows, in slow motion, how the metal flows around the die. The picture runs 35 min. and is available to engineering societies, colleges, training schools, etc.

The book, "Die Casting for Engineers," discusses alloys, die construction, applications, specifications, tests, machining practice, methods and tools for flash removal, finishes, and design. It is 148 pages long, and costs a dollar.

Buffalo in Red, Rochester In Black in Can Collection

• • • Rochester, N. Y., is making a small profit on its can salvaging and Buffalo is going in the hole, it was announced last week by officials of the two cities. During October, Rochester's cost for municipal collection, publicity and advertising was \$1,094.81. Receipts for cans collected amounted to \$1,489.89, making a profit of \$55.08. On the first collected, made in August, the city lost \$519.

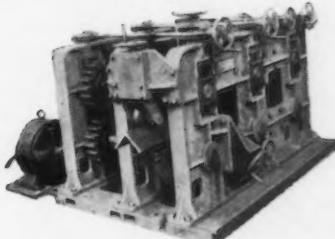
Money Metal

• • • U. S. silver is being lent to Britain and Australia for coinage, Secretary Morgenthau announced last week. The two countries need more silver money because of the presence of so many soldiers, including Americans. Each borrowing country is to return an equal amount of silver after the war.

Ordnance Metals Saved

• • • Army ordnance engineers are following a substitute-with-steel program which, when fully in effect, will free 180,000,000 lb. of primary aluminum and untold amounts of copper and copper alloys for more indispensable war production jobs, the American Iron and Steel Institute has announced. Sights, range-finders, fuses, fuse setters, components of anti-tank mines, fire control instruments, "windshields" for long range, high velocity shells, and carriage parts for guns from 20 to 155 mm. are among the items being converted to steel, the Institute reports.

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SCRAP

... Market Activities and Quotation Trends

Extreme Weather Brings Pessimism

Pittsburgh

••• Extreme winter weather in the Midwestern part of the country during the past few weeks has caused some optimists to turn slightly pessimistic over the present and future scrap picture. While it is true substantial stocks of scrap exist for the country as a whole, it is said that there are unbalances as to location.

Some scrap observers believe certain localities which do not produce enough scrap for their own consumption have far less inventories, relatively speaking, than the average for the country as a whole. There have, however, been no cases within the past few weeks where mills have had to shut down for lack of scrap. The general optimism in some quarters, however, has been toned down to a more realistic point where it is generally agreed that no letup in the drive for scrap collections and preparations should materialize.

In some territories such as Uniontown, Pa., Connellsville, Pa., and other nearby areas, some yards which had been receiving as high as 30 to 40 truckloads of

scrap a day received only four to 10 truckloads during the recent cold and icy weather. This situation is expected to be repeated many times before winter is over.

Further evidence that scrap may be more difficult to obtain as time goes on can be found in the results of more recent scrap drives. In many instances original quotas have not been realized, apparently because previous collections had fairly well cleaned up household accumulations. An example is the case of the Allegheny County Volunteer Firemen's Organization, as well as Pittsburgh's City Firemen, who had set a goal of 1000 tons and so far have barely reached 600 tons. At Newark, N. J., and Philadelphia, recent household drives also fell below expectations.

Another adverse factor which will require, from time to time, the use of scrap supplies or additional material, will be found in the periodic shutting down of some blast furnaces for repairs, as well as some unlooked for "break throughs" which will mean the need for additional scrap in place of the pig iron lost.

The RFC has been asked by

Donald M. Nelson to purchase through Metals Reserve Co. 35,000 tons of prepared iron and steel scrap in the west coast region within the next 30 days. The request, instigated by a relative abundance of scrap in the Pacific area, was aimed at providing definite means for removing accumulated scrap from dealers' yards in order to allow them to improve and accelerate their operations.

Metals Reserve Co. has been asked to establish stockpiles of prepared iron and steel scrap at points to be designated by WPB within the area comprising the states of Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Idaho, Nevada, Washington, Oregon and California. Purchases will be within the OPA ceiling prices and shall be under the direction of WPB. Sales will also be under the direction of WPB after consultation with Metals Reserve Co. and in accord with prices established by the OPA.

Recent price interpretations by OPA include several covering Price Schedule 4, maximum prices for iron and steel scrap. The rulings include:

The mixed shipment provisions of the schedule do not apply merely to mixtures of various grades of steel or various grades of cast. These provisions also apply where steel and cast scrap are mixed in the same vehicle.

Where a railroad company failed to submit average price information for a particular grade within two weeks after Feb. 9, 1942, as required by Section 1304.14 (a) or (b), its maximum price for such grade is determined by Section 1304.14 (d), even if the failure to submit such information was inadvertent.

In the event a shipment of scrap is rejected and reworked and then reshipped to another consumer the scrap assumes a new shipping point computed on the basis of the point from which the scrap is reworked. Thus, where the scrap is shipped by rail after reworking the scrap is at its shipping point after it has been reworked and loaded on cars.

"Uncut frogs and switches" are classified as unprepared No. 1 heavy melting steel under the schedule.

Black sheet scrap, such as auto body and fender stock, suitable for preparation into No. 2 bundles, is unprepared No. 2 bundles and may be sold at a price not to exceed \$4.00 per gross ton below the maximum price for No. 2 bundles. Such scrap is not to be considered as the unprepared form of No. 2 busheling.

Under the schedule, payment for all scrap is to be made on the basis of weights at the point of delivery. Where a consumer is a member of a weighing association or has facilities for weighing scrap, settlement should be on the basis of mill weights. Where the consumer does not have weighing facilities, settlement is to be made on the basis of railroad weights. Shippers' weights may not be used to determine the weight at the point of delivery.

In computing the maximum shipping point price a dealer in scrap need not have yard facilities for handling water shipment of scrap, nor need he have handled scrap by barge movement, to be permitted to deduct the barge rate, the

CENSORED GLIMPSE: The censors don't mind this much of a peak at one of the production operations in the making of high explosive shells. This photo was made in a plant formerly devoted to the assembly of Oldsmobiles by General Motors.



dock charge, and the lowest established switch from his yard to the dock at a particular point. Thus, if there is an established barge rate from point X to the most favorable basing point, a dealer having a yard away from the point X water front, may use such barge rate in computing his maximum shipping point price.

The maximum shipping point price is the same for any one grade of scrap, at any particular shipping point, regardless of the quantity of scrap shipped. Thus, a comparison should be made of the computation of the shipping point prices within a basing point where the same switching charge deduction is used, regardless of the tonnage shipped and regardless of whether delivery is by rail or solely by motor vehicle.

WPB Reports Several Salvage Jobs Started

Philadelphia

••• A number of salvage jobs are reported here this week, some of a rather unique nature, by the Salvage Branch of the WPB Special Projects Division.

About 10,300 ft. of steel fence which will yield 340 tons of scrap will soon be removed from the estate of Mrs. Edw. T. Stotesbury in suburban Philadelphia. A hosiery mill of the Gotham Silk Hosiery Co., located here, will soon be cleared of 121 knitting machines to yield 720 tons of steel scrap, plus brass and bronze.

The old elephant house at the local zoo which was demolished some time ago to provide material for an additional lion house has been turned over to the scrap drive instead. The building yielded about 40 tons of steel.

• **BUFFALO**—With the closing of Great Lakes navigation, the acute manpower situation in Buffalo scrap yards has been relieved to some extent by laid-off ore dock workers. Except for one buyer, who complains he has only enough visible scrap for six weeks, mill-stocks remain good for two to three months.

• **CINCINNATI**—While material in dealers' yards is slowly drying up, the general supply of scrap continues to be adequate for the present and for needs into the future for at least a short time.

• **DETROIT**—A "jalopy drive" started in December by the Wayne County Salvage Committee has already located approximately 1000 old automobiles, and efforts have begun in all cases to move them toward scrap piles.

• **PHILADELPHIA**—Near zero weather here has slowed movement from the yards perceptibly and dealers report that the inflow of scrap has almost disappeared while yard processing has become exceedingly difficult under the weather conditions. All mills are taking scrap now after several weeks of strictly scheduled shipments or of having been off the scrap

market entirely. Mills stocks are reported comfortable although this picture may change soon as authoritative sources say that shipments to the mills are off 30 to 50 per cent from a month ago.

• **PITTSBURGH**—The past week has seen a considerable slowing up in scrap movements to scrap yards which will undoubtedly be reflected in mill shipments very shortly. The situation is not by any means serious as yet but prolonged snows or cold weather will produce unbalances, especially in districts like this, where original supplies are far below the consumption rate.

Ickes Praises Bethlehem For Work on New Pipeline

Washington

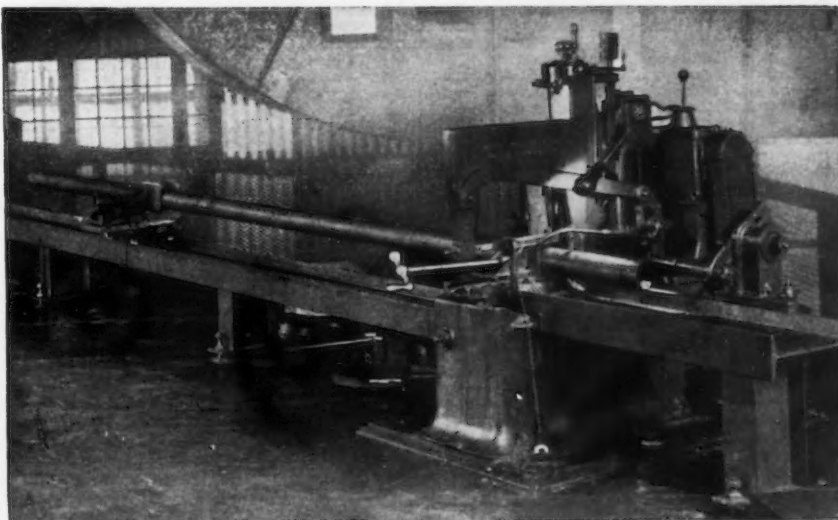
••• Petroleum Administrator Ickes in a statement issued Dec. 16 commended Bethlehem Steel Co. for the work it has done in manufacturing much needed equipment for the 24-in. oil pipeline from Longview, Tex., to Norris City, Ill. Mr. Ickes' statement was inspired by what he said was a misinterpretation of previous remarks implying criticism of Beth-

lehem's cooperation with the Government in making equipment for the pipeline.

Said Mr. Ickes:

"When I spoke about the manufacture of certain vital pipeline equipment by Bethlehem Steel at my press conference last Thursday (Dec. 10) my brief remarks were so interpreted as to imply criticism of Bethlehem's wartime cooperation with the Government in this tremendously important undertaking.

"As a matter of fact, no such criticism was intended or made by myself. Furthermore I now find from an examination of the record that the contract for manufacture of the equipment to which I referred actually was placed with Bethlehem only recently after we had learned that another manufacturer would be unable to meet our delivery schedule. Bethlehem Steel has cooperated splendidly with us in meeting this emergency requirement; so well, in fact, that I am now told that the necessary equipment will be fabricated a matter of several weeks in advance of the date previously set."



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SCRAP PRICES

IRON AND STEEL (OTHER THAN RAILROAD) SCRAP

ELECTRIC FURNACE, ACID OPEN HEARTH AND FOUNDRY GRADES																	
All Prices Are Per Gross Ton																	
BASIC OPEN HEARTH GRADES			BLAST FURNACE GRADES			Low Phos.			Heavy Structural and Plate			Cut Auto Steel Scrap					
(No. 1 Heavy Melting; No. 1 Hydr. Compressed Black Sheets, No. 2 Heavy Melting; Dealers' No. 1 Bundles; Dealers' No. 2 Bundles; No. 1 Busheling)			Unbaled* Machine Shop Turnings	(Mixed Borings and Turnings; Shovelling Turnings; No. 2 Busheling; Cast Iron Borings)	No. 2 Busheling	Billet, Bloom, Forge Crops	Bar Crops, Punchings, Plate Scrap and Cast Steel	3 ft. and Under	2 ft. and Under	1 ft. and Under	3 ft. and Under	2 ft. and Under	1 ft. and Under	1 ft. and Under	Alloy Free Low Phos. and Sulphur Turnings	Heavy Axle and Forge First Cut	Electric Furnace Bundles
Pittsburgh, Brackenridge, Butler, Monessen, Midland, Johnstown, Sharon, Canton, Steubenville, Warren, Youngstown, Weirton, Cleveland, Middletown, Cincinnati, Portsmouth,	20.00	16.00	16.00	17.50	25.00	22.50	21.00	21.50	22.00	20.00	20.50	21.00	21.00	19.50	19.50	21.00	21.00
Chicago, Claymont, Coatesville, Conshohocken, Harrisburg, Phoenixville, Sparrows Pt.,	18.75	14.75	14.75	16.25	23.75	21.25	19.75	20.25	20.75	18.75	19.25	19.75	16.75	18.25	19.75	18.25	19.75
Ashland, Ky.,	19.50	15.50	15.50	17.00	24.50	22.00	20.50	21.00	21.50	19.50	20.00	20.50	17.50	19.00	20.50	19.00	20.50
Buffalo, N. Y.,	19.25	15.25	15.25	16.75	24.25	21.75	20.25	20.75	21.25	19.25	19.75	20.25	17.25	18.75	20.25	18.75	20.25
Bethlehem, Pa.; Kokomo, Ind.,	18.25	14.25	14.25	15.75	23.25	20.75	19.25	19.75	20.25	18.25	18.75	19.25	16.25	17.75	19.25	17.75	19.25
Duluth, Minn.,	18.00	14.00	14.00	15.50	23.00	20.50	19.00	19.50	20.00	18.00	18.50	19.00	16.00	17.50	19.00	17.50	19.00
Detroit, Mich.,	17.85	13.85	13.85	15.35	22.85	20.35	19.85	19.35	19.85	17.85	18.35	18.85	15.85	17.35	18.85	17.35	18.85
Toledo, Ohio,	17.85	13.85	13.85	15.35	22.85	20.35	19.85	19.35	19.85	17.85	18.35	18.85	15.85	17.35	18.85	17.35	18.85
St. Louis, Mo.,	17.50	13.50	13.50	15.00	22.50	20.00	18.50	19.00	19.50	17.50	18.00	18.50	15.50	17.00	18.50	17.00	18.50
Atlanta, Ga.; Alabama City, Ala.; Birmingham, Los Angeles;	17.00	13.00	13.00	14.50	22.00	19.50	18.00	18.50	19.00	17.00	17.50	18.00	15.00	16.50	18.00	16.50	18.00
MPittsburgh, Cal.; San Francisco Innequa, Colo.,	16.50	12.50	12.50	14.00	21.50	19.00	17.50	18.00	18.50	16.50	17.00	17.50	14.50	16.00	17.50	16.00	17.50
Seattle, Wash.,	14.50	10.50	10.50	12.00	19.50	17.00	15.50	16.00	16.50	14.50	15.00	15.50	12.50	14.00	15.50	14.00	15.50

Composite Prices . . .

Advances Over Past Week in Heavy Type; Declines in Italics. [Prices Are F.O.B. Major Basing Points]

Flat Rolled Steel:					Pig Iron:				
(Cents Per Lb.)					(Per Gross Ton)				
	Dec. 21, 1942	Dec. 14, 1942	Nov. 24, 1942	Dec. 22, 1941		Dec. 21, 1942	Dec. 14, 1942	Nov. 24, 1942	Dec. 22, 1941
Hot rolled sheets	2.10	2.10	2.10	2.10	No. 2 fdy., Philadelphia	\$25.89	\$25.89	\$25.89	\$25.84
Cold rolled sheets	3.05	3.05	3.05	3.05	No. 2, Valley furnace	24.00	24.00	24.00	24.00
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50	No. 2, Southern Cin'ti	24.68	24.68	24.68	24.06
Hot rolled strip	2.10	2.10	2.10	2.10	No. 2, Birmingham	20.38	20.38	20.38	20.38
Cold rolled strip	2.80	2.80	2.80	2.80	No. 2, foundry, Chicago†	24.00	24.00	24.00	24.00
Plates	2.10	2.10	2.10	2.10	Basic, del'd eastern Pa.	25.39	25.39	25.39	25.34
Plates, wrought iron	3.80	3.80	3.80	3.80	Basic, Valley furnace	23.50	23.50	23.50	23.50
Stain's c.r. strip (No. 302)	28.00	28.00	28.00	28.00	Malleable, Chicago†	24.00	24.00	24.00	24.00
Tin and Terne Plate:					Malleable, Valley	24.00	24.00	24.00	24.00
(Dollars Per Base Box)					L. S. charcoal, Chicago	31.34	31.34	31.34	31.34
Tin plate, standard cokes	\$5.00	\$5.00	\$5.00	\$5.00	Ferromanganese†	135.00	135.00	135.00	120.00
Tin plate, electrolytic	4.50	4.50	4.50	4.50	†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.				
Special coated mfg. ternes	4.30	4.30	4.30	4.30	†For carlots at seaboard.				
Bars and Shapes:					Scrap:				
(Cents Per Lb.)					(Per Gross Ton)				
Merchant bars	2.15	2.15	2.15	2.15	Heavy melting steel, P'gh.	\$20.00	\$20.00	\$20.00	\$20.00
Cold finished bars	2.65	2.65	2.65	2.65	Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Alloy bars	2.70	2.70	2.70	2.70	Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
Structural shapes	2.10	2.10	2.10	2.10	No. 1 hy. comp. sheet, Det.	17.85	17.85	17.85	17.85
Stainless bars (No. 302)	24.00	24.00	24.00	24.00	Low phos. plate, Youngs'n	22.50	22.50	22.50	23.00
Wrought iron bars	4.40	4.40	4.40	4.40	No. 1 cast, Pittsburgh	20.00	20.00	20.00	22.00
Wire and Wire Products:					No. 1 cast, Philadelphia	20.00	20.00	20.00	24.00
(Cents Per Lb.)					No. 1 cast, Ch'go	20.00	20.00	20.00	20.00
Plain wire	2.60	2.60	2.60	2.60	Coke, Connellsville:				
Wire nails	2.55	2.55	2.55	2.55	(Per Net Ton at Oven)				
Rails:					Furnace coke, prompt	\$6.00	\$6.00	\$6.00	\$6.125
(Dollars Per Gross Ton)					Foundry coke, prompt	6.875	6.875	6.875	6.875
Heavy rails	\$40.00	\$40.00	\$40.00	\$40.00	Non-Ferrous Metals:				
Light rails	40.00	40.00	40.00	40.00	(Cents per Lb. to Large Buyers)				
Semi-Finished Steel:					Copper, electro., Conn.	12.00	12.00	12.00	12.00
(Dollars Per Gross Ton)					Copper, Lake, New York	12.00	12.00	12.00	12.00
Rerolling billets	\$34.00	\$34.00	\$34.00	\$34.00	Tin (Straits), New York	52.00	52.00	52.00	52.00
Sheet bars	34.00	34.00	34.00	34.00	Zinc, East St. Louis	8.25	8.25	8.25	8.25
Slabs	34.00	34.00	34.00	34.00	Lead, St. Louis	6.35	6.35	6.35	5.70
Forging billets	40.00	40.00	40.00	40.00	Antimony (Asiatic), N. Y.	16.50	16.50	16.50	16.50
Alloy blooms, billets, slabs	54.00	54.00	54.00	54.00	The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 104 to 112 herein.				
Wire Rods and Skelp:					Comparison of Prices . . .				
(Cents Per Lb.)					FINISHED STEEL				
Wire rods	2.00	2.00	2.00	2.00	Dec. 21, 1942	2.30467c. a Lb.	23.61 a Gross Ton	\$19.17 a Gross Ton	
Skelp (grvd)	1.90	1.90	1.90	1.90	One week ago	2.30467c. a Lb.	23.61 a Gross Ton	\$19.17 a Gross Ton	
					One month ago	2.30467c. a Lb.	23.61 a Gross Ton	\$19.17 a Gross Ton	
					One year ago	2.30467c. a Lb.	23.61 a Gross Ton	\$19.17 a Gross Ton	

Comparison of Prices . . .

FINISHED STEEL				PIG IRON				SCRAP STEEL			
Dec. 21, 1942	2.30467c. a Lb.			23.61 a Gross Ton				\$19.17 a Gross Ton			
One week ago	2.30467c. a Lb.			23.61 a Gross Ton				\$19.17 a Gross Ton			
One month ago	2.30467c. a Lb.			23.61 a Gross Ton				\$19.17 a Gross Ton			
One year ago	2.30467c. a Lb.			23.61 a Gross Ton				\$19.17 a Gross Ton			
HIGH		LOW		HIGH		LOW		HIGH		LOW	
1942	2.30467c.	2.30467c.	2.30467c.	\$23.61	\$23.61	\$23.61	\$23.61	\$19.17	\$19.17	\$19.17	\$19.17
1941	2.30467c.	2.30467c.	2.30467c.	23.61, Mar. 20	23.45, Jan. 2	23.45, Jan. 2	23.45, Jan. 2	22.00, Jan. 7	19.17, Apr. 10	19.17, Apr. 10	19.17, Apr. 10
1940	2.30467c., Jan. 2	2.24107c., Apr. 16	2.24107c., Apr. 16	23.45, Dec. 23	22.61, Jan. 2	22.61, Jan. 2	22.61, Jan. 2	21.83, Dec. 30	16.04, Apr. 9	16.04, Apr. 9	16.04, Apr. 9
1939	2.35367c., Jan. 3	2.26689c., May 16	2.26689c., May 16	22.61, Sept. 19	20.61, Sept. 12	20.61, Sept. 12	20.61, Sept. 12	22.50, Oct. 3	14.08, May 16	14.08, May 16	14.08, May 16
1938	2.58414c., Jan. 4	2.27207c., Oct. 18	2.27207c., Oct. 18	23.25, June 21	19.61, July 6	19.61, July 6	19.61, July 6	15.00, Nov. 22	11.00, June 7	11.00, June 7	11.00, June 7
1937	2.58414c., Mar. 9	2.32263c., Jan. 4	2.32263c., Jan. 4	23.25, Mar. 9	20.25, Feb. 16	20.25, Feb. 16	20.25, Feb. 16	21.92, Mar. 30	12.67, June 9	12.67, June 9	12.67, June 9
1936	2.32263c., Dec. 28	2.05200c., Mar. 10	2.05200c., Mar. 10	19.74, Nov. 24	18.73, Aug. 11	18.73, Aug. 11	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9	12.67, June 9	12.67, June 9
1935	2.07642c., Oct. 1	2.06492c., Jan. 8	2.06492c., Jan. 8	18.84, Nov. 5	17.83, May 14	17.83, May 14	17.83, May 14	13.42, Dec. 10	10.33, Apr. 29	10.33, Apr. 29	10.33, Apr. 29
1934	2.15367c., Apr. 24	1.95757c., Jan. 2	1.95757c., Jan. 2	17.90, May 1	16.90, Jan. 27	16.90, Jan. 27	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25	9.50, Sept. 25	9.50, Sept. 25
1933	1.95578c., Oct. 3	1.75836c., May 2	1.75836c., May 2	16.90, Dec. 5	13.56, Jan. 3	13.56, Jan. 3	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3	6.75, Jan. 3	6.75, Jan. 3
1932	1.89196c., July 5	1.83901c., Mar. 1	1.83901c., Mar. 1	14.81, Jan. 5	13.56, Dec. 6	13.56, Dec. 6	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5	6.43, July 5	6.43, July 5
1931	1.99629c., Jan. 13	1.86586c., Dec. 29	1.86586c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	14.79, Dec. 15	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29	8.50, Dec. 29	8.50, Dec. 29
1930	2.25488c., Jan. 7	1.97319c., Dec. 9	1.97319c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.90, Dec. 16	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9	11.25, Dec. 9	11.25, Dec. 9
1929	2.31773c., May 28	2.26498c., Oct. 29	2.26498c., Oct. 29	18.71, May 14	18.21, Dec. 17	18.21, Dec. 17	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3	14.08, Dec. 3	14.08, Dec. 3
Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.											
Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.											
Weighted index based on steel bars, beams, tank plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 per cent of the United States output. Index re-capitulated in Aug. 28, 1941, issue.											

Prices of Finished Iron and Steel...

Steel prices shown here are f.o.b. basing points, in cents per lb., unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, reductions, and in most cases freight absorbed to meet competition. Delivered prices do not reflect new 3 per cent tax on freight rates.

Basing Point ↓ Product	DELIVERED TO														
	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	Gulf Ports, Cars	Pacific Ports, Cars	Detroit	New York	Phila- delphia
SHEETS															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.22¢	2.35¢	2.28¢
Cold rolled ¹	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.17¢	3.41¢	3.39¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.75¢	3.68¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.47¢	3.73¢	3.69¢
Long ternes ²	3.80¢		3.80¢									4.55¢		4.18¢	4.14¢
STRIP															
Hot rolled ³	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.22¢	2.48¢	
Cold rolled ⁴	2.80¢	2.90¢		2.80¢			2.80¢		(Worcester = 3.00¢)				2.92¢	3.18¢	
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢							2.58¢	
Commodity C-R	2.95¢			2.95¢			2.95¢		(Worcester = 3.35¢)				3.07¢	3.33¢	
TIN MILL PRODUCTS															
Coke tin plate, base box	\$5.00	\$5.00	\$5.00						\$5.10					5.38¢	5.34¢
Electrolytic tin plate, box	\$4.50		\$4.50												
Black plate, 29 gage ⁵	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢ ¹²			3.39¢
Mfg. ternes, special box	\$4.30	\$4.30	\$4.30						\$4.40						
BARS															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			(Duluth = 2.25¢)		2.52¢	2.80¢	2.27¢	2.51¢	2.49¢
Rail steel ⁶	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢					2.52¢	2.80¢			
Reinforcing (billet) ⁷	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.52¢	2.55¢ ¹³	2.27¢	2.40¢	
Reinforcing (rail) ⁷	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢				2.52¢	2.55¢ ¹³	2.27¢		2.49¢
Cold finished ⁸	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢			(Detroit = 2.70¢)					3.01¢	2.99¢
Alloy, hot rolled	2.70¢	2.70¢				2.70¢			Bethlehem, Massillon, Canton = 2.70¢				2.82¢		
Alloy, cold drawn	3.35¢	3.35¢	3.35¢	3.35¢		3.35¢							3.47¢		
									(Coatesville and Claymont = 2.10¢)						
PLATES															
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	2.25¢ ¹¹		2.47¢	2.65¢	2.33¢	2.30¢	2.155¢
Floor plates	3.35¢	3.35¢									3.72¢	4.00¢		3.73¢	3.69¢
Alloy	3.50¢	3.50¢							(Coatesville = 3.50¢)		3.97¢	4.15¢		3.71¢	3.60¢
SHAPES															
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢			(Bethlehem = 2.10¢)		2.47¢	2.75¢		2.28¢	2.22¢
SPRING STEEL, C-R															
0.26 to 0.50 Carbon	2.80¢			2.80¢					(Worcester = 3.00¢)						
0.51 to 0.75 Carbon	4.30¢			4.30¢					(Worcester = 4.50¢)						
0.76 to 1.00 Carbon	6.15¢			6.15¢					(Worcester = 6.35¢)						
1.01 to 1.25 Carbon	8.35¢			8.35¢					(Worcester = 8.55¢)						
WIRE⁹															
Bright ¹⁰	2.60¢	2.60¢		2.60¢	2.60¢				(Worcester = 2.70¢)			3.10¢			2.94¢
Galvanized															
Spring (High Carbon)	3.20¢	3.20¢		3.20¢					(Worcester = 3.30¢)			3.70¢			3.54¢
PILING															
Steel sheet	2.40¢	2.40¢				2.40¢						2.95¢			2.74¢

¹ Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base. ² Unassorted 8-lb. coating. ³ Widths up to 12 in. ⁴ Carbon 0.25 per cent and less. ⁵ Applies to certain width and length limitations. ⁶ For merchant trade. ⁷ Prices for straight length material only, from a producer to a consumer. Functional discount of 25c. per 100 lb. to fabricators. ⁸ Also shafting. For quantities of 20,000 to 39,999 lb. ⁹ Carload lot to manufacturing trade. ¹⁰ These prices do not apply if the customary means of transportation (rail and water) are not used. ¹¹ Ship plates only. ¹² Boxed. ¹³ Portland and Seattle price, San Francisco price is 2.50c. ¹⁴ This bright wire base price to be used in figuring annealed and bright finish wires, commercial spring wire and galvanized wire.

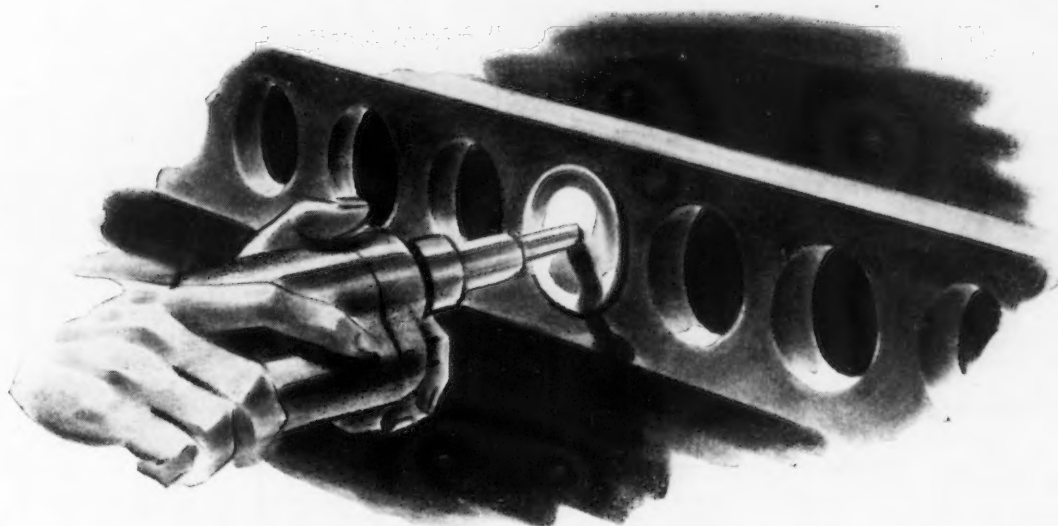
GOVERNMENT CEILINGS—Price Schedule No. 6 issued April 16, 1941, governs steel mill prices; Price Schedule No. 49 governs warehouse prices, which are on another page of this issue.

EXCEPTIONS TO PRICE SCHEDULE No. 6—On hot rolled carbon bars, Phoenix Iron Co. may quote 2.35c. at established basing points; Calumet Steel division of Borg Warner may quote 2.35c., Chicago, on bars from its 8-in. mill; Joslyn Mfg. Co. may quote 2.35c., Chicago base. On rail steel bars Sweets Steel Co. may quote 2.33c., f.o.b. mill. On hot rolled sheets, Andrews Steel Co. may quote for shipment to Detroit area on Middletown base. On galvanized sheets, Andrews Steel may quote 3.75c., at established basing points. On hot rolled strip, Joslyn Mfg. Co. may quote 2.30c., Chicago base. On plates, Granite City Steel Co. may quote 2.35c., f.o.b. mill, and Central Iron & Steel Co. may quote 2.20c., f.o.b. basing points. On shapes, Phoenix Iron Co. may quote 2.30c. established basing points and 2.50c. Phoenixville for export.

On rail steel merchant bars, Eckels-Nye Corp. may charge 2.40c. On tubing, South Chester Tube Co. may price Gulf or Pacific Coast all-rail shipments and shipments west of Harrisburg on basis of f.o.b. Chester. On lend-lease sales to eastern seaboard, Sheffield Steel Co. and Colorado Fuel & Iron Corp. may sell f.o.b. mill. **SEMI-FINISHED STEEL**—Follansbee Steel Corp. may sell forging billets at \$49.50 f.o.b. Toronto; Continental Steel Corp. may sell Acme Steel Co. at \$34 for rerolling billets plus extras and freight; Ford Motor Co. may sell rerolling billets at \$34 f.o.b. Dearborn; Andrews Steel Co. may sell forging billets at \$50 at established basing points and slabs at \$41; Empire Sheet and Tin Plate may sell slabs at \$41 at established basing points and sheet bars at \$39 f.o.b. mill; on lend-lease sales Northwestern Steel & Wire Co. may charge \$41 per gross ton f.o.b. mill for rerolling billets; on lend-lease sales Wheeling Steel Corp. may charge \$36 per ton for small billets, f.o.b. Portsmouth and \$37 per ton for sheet bars f.o.b. Portsmouth; Laclede Steel Co. on semfinished sales for lend-lease shipped to eastern seaboard may use Chicago basing point prices f.o.b. Alton and Madison, Ill. **ALLOY STEEL BARS**—Texas Steel Co. may use Chicago base f.o.b. Fort Worth.

SLOTTED ABRASIVE DISC SPEEDS BURRING OF HOLES

Grinds top and bottom edges of holes to true radius — all in one operation



THE job of removing the burr and producing the true radius required on all holes in aircraft engines has been greatly simplified by the introduction of the slotted abrasive disc. Made of Aloxite Brand Electrocoated Aluminum Oxide Metal Cloth, these discs are being widely used for burring and polishing all metal hole edges, from $\frac{3}{8}$ " to $5\frac{1}{2}$ " in diameter.

The speedy performance of the disc is a result of the flexibility achieved by its slotted design. Using a disc proportionately larger than the diameter of the hole, mounted on a spindle for use in a portable electric or air-driven tool, the operator presses it against the edge of the hole, as in the diagram below. Accommodating itself to the opening, the disc "cones" backward, sanding only the edge of the hole, leaving the flat surface untouched.

If both ends of the holes are to be finished, two discs mounted back to back are used. They are first pushed through and then pulled back against the opposite edge of the hole.

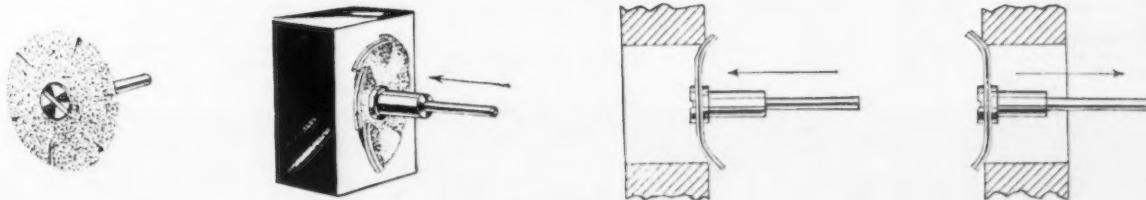
Uses for this new abrasive "Weapon for Production" are many and varied. Such parts as valve rocker arms, connecting-rods, tappet guides, oil holes etc., having openings larger than $\frac{7}{16}$ ", are typical of its wide application.

In ordering slotted abrasive discs, it is important to select the correct grit for the kind of metal employed and the finish required.

If you care to try a few of these slotted discs we will be glad to send them free of charge. Simply address your request to Dept. I, The Carborundum Company, Niagara Falls, N. Y.



DIAGRAMS SHOW HOW SLOTTED DISC WORKS



THE CARBORUNDUM COMPANY, NIAGARA FALLS, N. Y.

REG. U. S. PAT. OFF.

Sales Offices and Warehouses in New York, Chicago, Philadelphia, Detroit, Cleveland, Boston, Pittsburgh, Cincinnati, Grand Rapids
(Carborundum and Aloxite are registered trade-marks of and indicate manufacture by The Carborundum Company)

PRICES

SEMI-FINISHED STEEL

For exceptions, see preceding page

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (rerolling only). Prices delivered Detroit are \$2.25 higher; f.o.b. Duluth, billets only, \$2 higher. Delivered prices do not reflect new per cent tax on freight rates.

	Per Gross Ton
Rerolling	\$34.00
Forging quality	40.00
Alloy Steel: Pittsburgh, Chicago, Canton, Massillon, Buffalo, or Bethlehem, per gross ton	\$54.00

Shell Steel

	Per Gross Ton
3 in. to 12 in.	\$52.00
12 in. to 18 in.	54.00
18 in. and over	56.00
Basic open hearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham.	
Prices delivered Detroit are \$2.25 higher.	

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open hearth or bessemer	\$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.90c.

Wire Rods

(No. 5 to 9/32 in.)

	Per Lb.
Pittsburgh, Chicago, Cleveland	2.00c.
Worcester, Mass.	2.10c.
Birmingham	2.00c.
San Francisco	2.50c.
Galveston	2.25c.

9/32 in. to 47/64 in., 0.15c. a lb. higher. Quantity extras apply.

TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse)

	Base per lb.
High speed	67c.
Straight molybdenum	54c.
Tungsten-molybdenum	57½c.
High-carbon-chromium	43c.
Oil hardening	24c.
Special carbon	22c.
Extra carbon	18c.
Regular carbon	14c.

Warehouse prices east of Mississippi are 2c. a lb. higher; west of Mississippi, 3c. higher.

CORROSION AND HEAT-RESISTING STEEL

(Per lb. base price, f.o.b. Pittsburgh)

Chromium-Nickel Alloys

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25.00c.	24.00c.
Plates	25.00c.	27.00c.
Structural shapes	25.00c.	24.00c.
Sheets	36.00c.	34.00c.
Hot rolled strip	23.50c.	21.50c.
Cold rolled strip	30.00c.	28.00c.
Drawn wire	25.00c.	24.00c.

Straight-Chromium Alloys

	No. 410	No. 430	No. 442	No. 446
F. Billets	15.725c.	16.15c.	19.125c.	23.375c.
Bars	18.50c.	19.00c.	22.50c.	27.50c.
Plates	21.50c.	22.00c.	25.50c.	30.50c.
Sheets	26.50c.	29.00c.	32.50c.	36.50c.
Hotstrip	17.00c.	17.50c.	24.00c.	35.00c.
Cold st.	22.00c.	22.50c.	32.00c.	52.00c.

Chromium-Nickel Clad Steel (20%)

	No. 304
Plates	18.00c.*
Sheets	19.00c.

*Includes annealing and pickling.

NATIONAL EMERGENCY STEELS (Hot Rolled) Extras for Alloy Content

Designa- tion	CHEMICAL COMPOSITION LIMITS, PER CENT								Basic Open-Hearth		Electric Furnace	
	Carbon	Man- ganese	Phos- phorus Max.	Sul- phur Max.	Silicon	Chro- mium	Nickel	Molyb- denum	Bars and Bar Strip	Billets, Blooms and Slabs	Bars and Bar Strip	Billets, Blooms and Slabs
NE 1330	.28 / .33	1.60/1.90	.040	.040	.20 / .35				.10c	\$2.00		
NE 1335	.33 / .38	1.60/1.90	.040	.040	.20 / .35				.10	2.00		
NE 1340	.38 / .43	1.60/1.90	.040	.040	.20 / .35				.10	2.00		
NE 1345	.43 / .48	1.60/1.90	.040	.040	.20 / .35				.10	2.00		
NE 1350	.48 / .53	1.60/1.90	.040	.040	.20 / .35				.10	2.00		
NE 8020	.18 / .23	1.00/1.30	.040	.040	.20 / .35			.10 / .20	.45	9.00	.95c	\$19.00
NE 8022	.20 / .25	1.00/1.30	.040	.040	.20 / .35			.10 / .20	.45	9.00	.95	19.00
NE 8339	.37 / .42	1.30/1.60	.040	.040	.20 / .35			.20 / .30	.75	15.00	1.25	25.00
NE 8442*	.40 / .45	1.30/1.60	.040	.040	.20 / .35			.30 / .40	.90	18.00	1.40	28.00
NE 8613	.12 / .17	.70 / .90	.040	.040	.20 / .35	.40 / .60	.40 / .60	.15 / .25	.75	15.00	1.25	25.00
NE 8615	.13 / .18	.70 / .90	.040	.040	.20 / .35	.40 / .60	.40 / .60	.15 / .25	.75	15.00	1.25	25.00
NE 8617	.15 / .20	.70 / .90	.040	.040	.20 / .35	.40 / .60	.40 / .60	.15 / .25	.75	15.00	1.25	25.00
NE 8620	.18 / .23	.70 / .90	.040	.040	.20 / .35	.40 / .60	.40 / .60	.15 / .25	.75	15.00	1.25	25.00
NE 8630	.28 / .33	.70 / .90	.040	.040	.20 / .35	.40 / .60	.40 / .60	.15 / .25	.75	15.00	1.25	25.00
NE 8715	.13 / .18	.70 / .90	.040	.040	.20 / .35	.40 / .60	.40 / .60	.20 / .30	.80	16.00	1.30	26.00
NE 8720	.18 / .23	.70 / .90	.040	.040	.20 / .35	.40 / .60	.40 / .60	.20 / .30	.80	16.00	1.30	26.00
NE 8722	.20 / .25	.70 / .90	.040	.040	.20 / .35	.40 / .60	.40 / .60	.20 / .30	.80	16.00	1.30	26.00
NE 8735	.33 / .38	.75 / 1.00	.040	.040	.20 / .35	.40 / .60	.40 / .60	.20 / .30	.80	16.00	1.30	26.00
NE 8739	.35 / .40	.75 / 1.00	.040	.040	.20 / .35	.40 / .60	.40 / .60	.20 / .30	.80	16.00	1.30	26.00
NE 8740	.38 / .43	.75 / 1.00	.040	.040	.20 / .35	.40 / .60	.40 / .60	.20 / .30	.80	16.00	1.30	26.00
NE 8744	.40 / .45	.75 / 1.00	.040	.040	.20 / .35	.40 / .60	.40 / .60	.20 / .30	.80	16.00	1.30	26.00
NE 8749	.45 / .50	.75 / 1.00	.040	.040	.20 / .35	.40 / .60	.40 / .60	.20 / .30	.80	16.00	1.30	26.00
NE 8949*	.45 / .50	1.00/1.30	.040	.040	.20 / .35	.40 / .60	.40 / .60	.30 / .40	1.20	24.00	1.70	34.00
NE 9255	.50 / .60	.70 / .95	.040	.040	1.80/2.20				.40c	8.00		
NE 9260	.55 / .65	.75 / 1.00	.040	.040	1.80/2.20				.40	8.00		
NE 9262	.55 / .65	.75 / 1.00	.040	.040	1.80/2.20	.20 / .40			.65	13.00		
NE 9415	.13 / .18	.80 / 1.10	.040	.040	.40 / .60	.20 / .40	.20 / .40	.08 / .15	.80	16.00	1.30c	\$26.00
NE 9420	.18 / .23	.80 / 1.10	.040	.040	.40 / .60	.20 / .40	.20 / .40	.08 / .15	.80	16.00	1.30	26.00
NE 9422	.20 / .25	.80 / 1.10	.040	.040	.40 / .60	.20 / .40	.20 / .40	.08 / .15	.80	16.00	1.30	26.00
NE 9430	.28 / .33	.90 / 1.20	.040	.040	.40 / .60	.20 / .40	.20 / .40	.08 / .15	.80	16.00	1.30	26.00
NE 9435	.33 / .38	.90 / 1.20	.040	.040	.40 / .60	.20 / .40	.20 / .40	.08 / .15	.80	16.00	1.30	26.00
NE 9437	.35 / .40	.90 / 1.20	.040	.040	.40 / .60	.20 / .40	.20 / .40	.08 / .15	.80	16.00	1.30	26.00
NE 9440	.38 / .43	.90 / 1.20	.040	.040	.40 / .60	.20 / .40	.20 / .40	.08 / .15	.80	16.00	1.30	26.00
NE 9442	.40 / .45	1.00 / 1.30	.040	.040	.40 / .60	.20 / .40	.20 / .40	.08 / .15	.85	17.00	1.35	27.00
NE 9445	.43 / .48	1.00 / 1.30	.040	.040	.40 / .60	.20 / .40	.20 / .40	.08 / .15	.85	17.00	1.35	27.00
NE 9450	.48 / .53	1.20 / 1.50	.040	.040	.40 / .60	.20 / .40	.20 / .40	.08 / .15	.85	17.00	1.35	27.00
NE 9537*	.35 / .40	1.20 / 1.50	.040	.040	.40 / .60	.40 / .60	.40 / .60	.15 / .25	1.20	24.00	1.70	34.00
NE 9540*	.38 / .43	1.20 / 1.50	.040	.040	.40 / .60	.40 / .60	.40 / .60	.15 / .25	1.20	24.00	1.70	34.00
NE 9542*	.40 / .45	1.20 / 1.50	.040	.040	.40 / .60	.40 / .60	.40 / .60	.15 / .25	1.20	24.00	1.70	34.00
NE 9550*	.48 / .53	1.20 / 1.50	.040	.040	.40 / .60	.40 / .60	.40 / .60	.15 / .25	1.20	24.00	1.70	34.00
NE 9630	.28 / .33	1.20 / 1.50	.040	.040	.40 / .60	.40 / .60			.80	16.00	1.30	26.00
NE 9635	.33 / .38	1.20 / 1.50	.040	.040	.40 / .60	.40 / .60			.80	16.00	1.30	26.00
NE 9637	.35 / .40	1.20 / 1.50	.040	.040	.40 / .60	.40 / .60			.80	16.00	1.30	26.00
NE 9640	.38 / .43	1.20 / 1.50	.040	.040	.40 / .60	.40 / .60			.80	16.00	1.30	26.00
NE 9642	.40 / .45	1.30 / 1.60	.040	.040	.40 / .60	.40 / .60			.85	17.00	1.35	27.00
NE 9645	.43 / .48	1.30 / 1.60	.040	.040	.40 / .60	.40 / .60			.85	17.00	1.35	27.00
NE 9650	.48 / .53	1.30 / 1.60	.040	.040	.40 / .60	.40 / .60			.85	17.00	1.35	27.00

*Recommended for large sections only.

Note: The extras shown above are in addition to a base price of 2.70c. per 100 lb., on finished products and \$54 per gross ton on semi-finished steel major basing points and are in cents per 100 lb. and dollars per gross ton in semi-finished.

ELECTRICAL SHEETS

(Base, f.o.b. Pittsburgh) Per Lb.

Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

F.o.b. Granite City, add 10c. per 100 lb. on field grade to and including dynamo. Pacific ports add 75c. per 100 lb. on all grades.

WIRE PRODUCTS

To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham

	Base per Keg
Standard wire nails	\$2.55
Coated nails	2.55
Cutnails, carloads	3.85
	Base per 100 Lb.
Annealed fence wire	\$3.05
Annealed galvanized fence wire	3.40
	Base Column
Woven wire fence*	67
Fence posts (carloads)	69
Single loop bale ties	59
Galvanized barbed wire†	70
Twisted barless wire	70

*1½" gage and heavier. †On 80-rod spools in carload quantities.

RAILS, TRACK SUPPLIES

(F.o.b. Mill)

Standard rails, heavier than 60 lb. gross ton	\$40.00
Angle bars, 100 lb.	2.70
(F.o.b. Basing Points) Per Gross Ton	
Light rails (from billets)	\$40.00
Light rails (from rail steel)	39.00

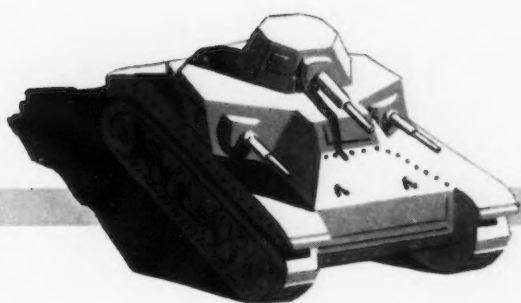
	Base per Lb.
Cut spikes	3.00c.
Screw spikes	5.15c.
Tie plates, steel	2.15c.
Tie plates, Pacific Coast	2.30c.
Track bolts	4.75c.
Track bolts, heat treated, to rail-roads	5.00c.
Track bolts, jobbers discount	63-5

Basing Points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond.

ROOFING TERNE PLATE

(F.o.b. Pittsburgh, 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C.	\$6.00	\$12.00
15-lb. coating I.C.	7.00	14.00
20-lb. coating I.C.	7.50	15.00



WELDING A STRONGER AMERICA ...THAT IS YOUR JOB AND OURS



CERTAINLY we all remember Pearl Harbor! We quietly observed a requiem throughout the length and breadth of this great land and realize now more than we did a year ago how our lives would change. But out of this terrible holocaust arose an all-consuming fire of indignation that has patriotically welded together the hearts and minds of all loyal Americans in a righteous cause and we solemnly dedicated ourselves to conquer and forever destroy all that our deceitful and unlawful enemies stand for.

We who had plants, big and little, that could convert our facilities to the war effort did so. The products we made during peace time and the services we rendered to the Brewing Industry were temporarily side-tracked making it impossible to serve our many loyal customers—but they know the reason why. To these friends we want to extend our Christmas greetings and to express the hope that next year we may really enjoy a traditionally old-fashioned Christmas with the bells ringing out over a once-more happy world.



STEEL COOPERAGE AND COATING CO.

Manufacturers of LEE Steel Barrels

BEAUFAIT STREET, DETROIT, MICHIGAN

PRICES

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts:

	Per Cent off List
1/2 in. & smaller x 6 in. & shorter	65 1/2
9/16 & 5/8 in. x 6 in. & shorter	63 1/2
3/4 to 1 in. x 6 in. & shorter	61
1 1/4 in. and larger, all length	59
All diameters over 6 in. long	59
Lag, all sizes	62
Plow bolts	65

Nuts, Cold Punched or Hot Pressed:

	(Hexagon or Square)
1/2 in. and smaller	62
9/16 to 1 in. inclusive	59
1 1/4 to 1 1/2 in. inclusive	57
1 5/8 in. and larger	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

Semi-Fin. Hexagon Nuts U.S.S. S.A.E.

	U.S.S.	S.A.E.
7/16 in. and smaller	62	64
1/2 in. and smaller	62	64
1/2 in. through 1 in.	60	60
9/16 to 1 in.	59	59
1 1/4 in. through 1 1/2 in.	57	58
1 5/8 in. and larger	56	56

In full container lots, 10 per cent additional discount.

Stove Bolts

Packages, nuts loose	71 and 10
In packages, with nuts attached	71
In bulk	80

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York on lots of 200 lb. or over.

Large Rivets (1/2 in. and larger)

	Base per 100 lb.
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	\$3.75

Small Rivets (7/16 in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	65 and 5

Cap and Set Screws Per Cent Off List

Upset full fin. hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in.	64
Upset set screws, cup and oval points	71
Milled studs	46
Flat head cap screws, listed sizes	36
Fillister head cap, listed sizes	51

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

PIG IRON

All prices set in bold face type are maxima established by OPA on June 24, 1941. Other domestic prices (in italics) are delivered quotations per gross ton computed on the basis of the official maxima. Delivered prices do not reflect new 3 per cent tax on freight rates.

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phosphorus	Charcoal
Boston††	\$25.53	\$25.03	\$26.53	\$26.03		
Brooklyn	27.65	26.00	28.15	25.50		
Jersey City	26.62	26.12	27.62	27.12		
Philadelphia	25.89	25.39	26.89	26.39		
Bethlehem, Pa.	25.00	24.50	26.00	25.50		
Everett, Mass.††	25.00	24.50	26.00	25.50		
Swedeland, Pa.	25.00	24.50	26.00	25.50		
Steelton, Pa.	25.00	24.50	26.00	25.50	\$29.50	
Birdsboro, Pa.	25.00	24.50	26.00	25.50	29.50	
Sparrows Point, Md.	25.00	24.50	26.00	25.50		
Erie, Pa.	24.00	23.50	25.00	24.50		
Neville Island, Pa.	24.00	23.50	24.50	24.00		
Sharpsville, Pa.*	24.00	23.50	24.50	24.00		
Buffalo	24.00	23.00	25.00	24.50	29.50	
Cincinnati	24.68	24.68		25.18		
Canton, Ohio	25.47	24.97	25.97	25.47		
Mansfield, Ohio	26.06	25.56	26.56	26.06		
St. Louis	24.50	24.00				
Chicago	24.00	23.50	24.50	24.00		\$31.34
Granite City, Ill.	24.00	23.50	24.50	24.00		
Cleveland	24.00	23.50	24.50	24.00		
Hamilton, Ohio	24.00	23.50	24.50	24.00		
Toledo	24.00	23.50	24.50	24.00		
Youngstown*	24.00	23.50	24.50	24.00		
Detroit	24.00	23.50	24.50	24.00		
Lake Superior fc.						\$28.00
Lyles, Tenn. fc.†						33.00
St. Paul	26.76		27.26	26.76		
Duluth	24.50	24.00	25.00	24.50		
Birmingham	20.38	19.00	25.00			
Los Angeles	27.25					
San Francisco	27.25					
Seattle	27.25					
Provo, Utah	22.00					
Montreal	27.50	27.50		28.00		
Toronto	25.50	25.50		26.00		

GRAY FORGE IRON: Valley or Pittsburgh furnace..... \$23.50

*Pittsburgh Coke & Iron Co. (Sharpsville, Pa., furnace only) and the Struthers Iron and Steel Co., Struthers, Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

**Pittsburgh Ferromanganese Co. (Chester furnace only) may charge \$2.25 a ton over maximum basing point prices.

†Price shown is for low-phosphorus iron; high-phosphorus sells for \$28.50 at the furnace.

††Eastern Gas & Fuel Associates, Boston, is permitted to sell pig iron produced by its selling company, Mystic Iron Works, Everett, Mass., at \$1 per gross ton above maximum prices.

Delta Chemical & Iron Co., Chicago, may charge \$30 for charcoal iron at its Delta, Mich., furnace.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50c. a ton for each 0.25 per cent silicon content in excess of base grade which is 1.75 per cent to 2.25 per cent); phosphorus differentials, a reduction of 38c. per ton for phosphorus content of 0.70 per cent and over; manganese differentials, a charge not to exceed 50c. per ton for each 0.50 per cent manganese content in excess of 1.00 per cent.

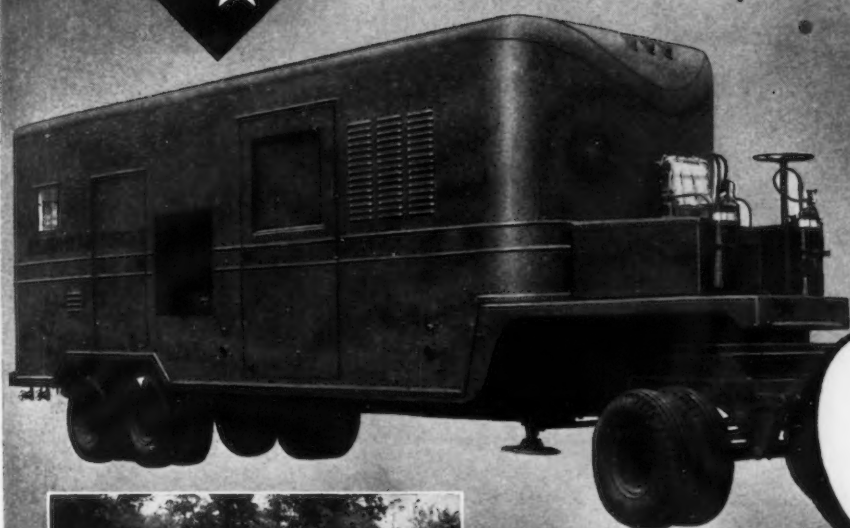
WAREHOUSE PRICES

(Delivered Metropolitan areas, per 100 lb. These prices do not necessarily apply for dislocated tonnage shipments when the f.o.b. City prices are used in conformance with OPA Schedule 49)

CITIES	SHEETS			STRIP		Plates (1/4 in. and heavier)	Structural Shapes	BARS		ALLOY BARS			
	Hot Rolled (10 ga.)	Cold Rolled	Galv. (24 ga.)	Hot Rolled	Cold Rolled			Hot Rolled	Cold Finished	Hot Rolled 2300	Hot Rolled 3100	Cold Drawn 2300	Cold Drawn 3100
Pittsburgh	\$3.35		\$4.65	\$3.60	\$3.20	\$3.40	\$3.40	\$3.35	\$3.65	\$7.45	\$5.75	\$8.40	\$6.75
Chicago	3.25	\$4.10	4.85 ¹	3.60	3.50	3.55	3.55	3.50	3.75	7.35	5.65	8.40	6.75
Cleveland	3.35	4.05	4.62	3.50	3.20	3.40	3.58	3.25	3.75	7.55	5.85	8.40	6.75
Philadelphia	3.55	4.05 ⁵	4.65	3.51	3.31	3.55	3.55	3.85	4.06	7.31	5.86	8.56	7.18
New York	3.58	4.60 ²	5.00	3.96 ⁶	3.51	3.76	3.75	3.84	4.09	7.60	5.90	8.84	7.19
Detroit	3.43	4.30	4.84 ¹	3.68 ⁹	3.40	3.60	3.65	3.43	3.80	7.67	5.97	8.70	7.05
Buffalo	3.25	4.30 ¹	4.75 ⁴	3.82	3.52	3.62	3.40	3.35	3.75	7.35	5.65	8.40	6.75
Boston	3.71	4.68	5.11	4.16	3.46	3.85	3.85	3.98	4.13	7.77	6.07	8.91	7.28
Birmingham	3.45 ³		4.75 ¹	3.70 ³		3.55 ³	3.55 ³	3.50 ³	4.18				
St. Louis	3.39	4.24 ²	4.99 ¹	3.74	3.61	3.69	3.69	3.64	4.02	7.72	6.02	8.77	7.12
St. Paul	3.50	4.35	5.00	3.85	3.83	3.80	3.80	3.75	4.34	7.45	6.00	8.84	7.44
Milwaukee	3.38	4.23 ²	4.98 ¹	3.73	3.54	3.68	3.68	3.63	3.88	7.58	5.88	8.63	6.98
Baltimore	3.50		5.05	4.00		3.70	3.70	3.85	4.04				
Cincinnati	3.42	4.37 ²	4.42 ¹	3.67	3.45	3.65	3.68	3.60	4.00	7.69	5.99	8.50	7.10
Norfolk	3.85		5.40	4.10		4.05	4.05	4.00	4.15				
Washington	3.60			4.10		3.80	3.80	3.95	4.10				
Indianapolis	3.45	4.25	5.01 ¹	3.75	3.28	3.70	3.70	3.60	3.97	7.67	5.97	8.72	7.07
Omaha	3.85		5.52 ¹	4.20		4.15	4.15	4.10	4.42				
Memphis	3.85		5.25	4.10		3.95	3.95	3.90	4.31				
New Orleans	4.05			4.30		3.90	3.90	4.10	4.60				
Houston	4.00			4.30		4.05	4.05	3.75					
Los Angeles	4.95	7.15	5.95	4.90		4.90	4.60	4.35	6.60	9.55	8.55	10.55	9.55
San Francisco	4.55	7.05	6.10	4.50		4.65	4.35	3.95	6.80	9.80	8.80	10.80	9.80
Seattle	4.65 ⁷		5.70 ⁷	4.25		4.75	4.45	4.20	5.75		8.00		

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb., galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities: cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over. Exceptions: ¹500 to 1499 lb. ²400 to 1499 lb. ³400 to 3999 lb. ⁴450 to 1499 lb. ⁵1000 to 1999 lb. ⁶0 to 1999 lb. ⁷300 to 10,000 lb. At Philadelphia galvanized sheets, 25 or more bundles; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; San Francisco, hot rolled sheets, 400 to 39,999 lb., galvanized and cold rolled sheets, 750 to 4999 lb., cold fin. bars, 0-299 lb.; hot rolled alloy bars, 0-4999 lb.; Seattle, cold finished bars, 1000 lb. and over, hot rolled alloy bars, 0-1999 lb.; Memphis, hot rolled sheets, 400 to 1999 lb., galvanized sheets, 150 and over; St. Paul, galvanized and cold rolled sheets, any quantity, hot rolled bars, plates, shapes, hot rolled sheets, 400 to 14,999 lb.; Los Angeles, hot rolled sheets, bars, plates, cold rolled sheets, 300 to 1999 lb.; galvanized sheets, 1 to 6 bundles; cold finished bars, 1 to 99 lb.; SAE bars, 100 lb. Extras for size, quality, etc., apply on above quotations. ⁸12 gage and heavier, \$3.43. ⁹Los Angeles, San Francisco and Seattle prices reflect special provisions of amendment No. 2 to OPA Price Schedule No. 49.

**The 1st ★ One Went into Army Service
Over a
Year Ago**



**Mobile
OXYGEN
Generators**



**And Ever Since, More
and More Independents Have
Been Supplying Oxygen for Our Fighting Forces**

Now on the World Battle Fronts



Pioneering developments carried on by Independent Engineers . . . exhaustive first-hand study in foreign lands—long before war clouds gathered . . . made it possible for this organization to design and produce these engines for

war . . . now serving wherever oxygen is needed to “keep ’em flying” . . . solving a vital problem in logistics.

This is but one of Independent’s many “FIRSTS” to help the war cause—watch for the news of others.

Uncle Sam If you know of anyone now in the service, or scheduled to be, who
NEEDS has had oxygen or hydrogen producing plant experience, suggest
Experienced Men that they investigate the opportunities in serving their country
to Operate in this field. Those in service consult with their superiors—those
These Machines entering service should consult with their local recruiting office.

If further details are wanted, we will be glad to supply them — address

Independent Engineering Co.



O’FALLON, ILLINOIS

PRICES

BOILER TUBES

Seamless Steel and Lap Weld Commercial
Boiler Tubes and Locomotive Tubes
Minimum Wall

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

		Seamless	Weld, Cold Hot	Hot Drawn Rolled
2	in. o.d. 13 B.W.G.	15.03	13.04	12.38
2½	in. o.d. 12 B.W.G.	20.21	17.54	16.58
3	in. o.d. 12 B.W.G.	22.48	19.50	18.35
3½	in. o.d. 11 B.W.G.	28.37	24.62	23.15
4	in. o.d. 10 B.W.G.	35.20	30.54	28.66

(Extras for less carload quantities)
40,000 lb. or ft. over Base
30,000 lb. or ft. to 39,999 lb. or ft. 5%
20,000 lb. or ft. to 29,999 lb. or ft. 10%
10,000 lb. or ft. to 19,999 lb. or ft. 20%
5,000 lb. or ft. to 9,999 lb. or ft. 30%
2,000 lb. or ft. to 4,999 lb. or ft. 45%
Under 2,000 lb. or ft. 65%

CAST IRON WATER PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	\$54.80
6-in. and larger, del'd New York	52.20
6-in. and larger, Birmingham	46.00
6-in. and larger f.o.b. cars, San Francisco or Los Angeles	69.40
6-in. and larger f.o.b. cars, Seattle	71.20

Class "A" and gas pipe, \$3 extra; 4-in. pipe is \$3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons or over, 6-in. and larger is \$45 at Birmingham and \$53.80 delivered Chicago. \$59.40 at San Francisco and Los Angeles, and \$70.20 at Seattle. Delivered prices do not reflect new 3 per cent tax on freight rates.

WELDED PIPE AND TUBING

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills
(F.o.b. Pittsburgh only on wrought pipe)
Base Price—\$200 per Net Ton

Steel (Butt Weld)	Black	Galv.
½ in.	63½	51
¾ in.	66½	55
1 to 3 in.	68½	57½

Wrought Iron (Butt Weld)		
½ in.	25	3½
¾ in.	30	10
1 and 1½ in.	34	16
1½ in.	38	18½
2 in.	37½	18

Steel (Lap Weld)		
2 in.	61	49½
2½ and 3 in.	64	52½
3½ to 6 in.	66	54½

Wrought Iron (Lap Weld)		
2 in.	30½	12
2½ to 3½ in.	31½	14½
4 in.	33½	18
4½ to 8 in.	32½	17

Steel (Butt, extra strong, plain ends)	Black	Galv.
½ in.	61½	50½
¾ in.	65½	54½
1 to 3 in.	67	57

Wrought Iron (Same as Above)		
½ in.	25	6
¾ in.	31	12
1 to 2 in.	38	19½

Steel (Lap, extra strong, plain ends)		
2 in.	59	48½
2½ and 3 in.	63	52½
3½ to 6 in.	66½	56

Wrought Iron (Same as Above)		
2 in.	33½	15½
2½ to 4 in.	39	22½
4½ to 6 in.	37½	21

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card. F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or \$2 a ton higher on all butt weld.

Ferroalloys

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans, Domestic, 80%, per gross ton (carloads)\$135.00

Spiegeleisen

Per Gross Ton Furnace
Domestic, 19 to 21%\$36.00
Domestic, 26 to 28% 49.50

Electric Ferrosilicon

(Per Gross Ton, Delivered Lump Size)
50% (carload lots, bulk)\$74.50
50% (ton lots, packed) 87.00
75% (carload lots, bulk)135.00
75% (ton lots, packed)151.00

Silvery Iron

(Per Gross Ton, base 6.00 to 6.50 \$4)
F.o.b. Jackson, Ohio\$29.50*
Buffalo 30.75*
For each additional 0.50% silicon add \$1 a ton. For each 0.50% manganese over 1% add 50c. a ton. Add \$1 a ton for 0.75% phosphorus or over.
*Official OPA price established June 24, 1941.

Bessemer Ferrosilicon

Prices are \$1 a ton above Silvery Iron quotations of comparable analysis.

Ferrochrome

(Per Lb., Contained Cr., Delivered Carlots, Lump Size, on Contract)
4 to 6 carbon13.00c.
2 carbon19.50c.
1 carbon20.50c.
0.10 carbon22.50c.
0.06 carbon23.00c.

Spot prices are ¼c. per lb. of contained chromium higher.

Silico-Manganese

(Per Gross Ton, Delivered, Carloads, Bulk)
3 carbon\$120.00
2.50 carbon 125.00
2 carbon 130.00
1 carbon 140.00

Other Ferroalloys

Ferrotungsten, per lb. contained W, del'd carload\$2.00
Ferrotungsten, 100 lb. and less... 2.25
Ferrovanadium, contract, per lb. contained V, del'd\$2.70 to \$2.90†
Ferrochromium, per lb. contained Cr, f.o.b. Niagara Falls, N. Y., ton lots\$2.25†
Ferrocobaltititanium, 15-18 Ti, 7-8 C, f.o.b. furnace, carload contract, net ton\$142.50
Ferrocobaltititanium, 17-20 Ti, 3-5 C, f.o.b. furnace, carload contract, net ton\$157.50
Ferrophosphorus, electric or blast furnace materials, carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage freight, equalized with Rockdale, Tenn., gross ton. \$58.50
Ferrophosphorus, electrolytic 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., \$3 unitage, freight equalized with Nashville, gross ton\$75.00
Ferromolybdenum, per lb., Mo, f.o.b. furnace 95c.
Calcium molybdate, per lb., Mo, f.o.b. furnace 80c.
Molybdenum oxide briquettes 48-52 Mo, per lb. contained Mo, f.o.b. Langeloth, Pa. 80c.
Molybdenum oxide, in cans, per lb. contained Mo, f.o.b. Langeloth, and Washington, Pa. 80c.

*Spot prices are \$5 per ton higher.
†Spot prices are 10c. per lb. of contained element higher.

LAKE SUPERIOR ORES

(51.50% Fe., Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer, 51.50	\$4.75
Old range, non-bessemer, 51.50	4.60
Mesaba, bessemer, 51.50	4.60
Mesaba, non-bessemer, 51.50	4.45
High phosphorus, 51.50	4.35

COKE*

Furnace	Per Net Ton
†Connellsville, prompt	\$6.00

Foundry

†Connellsville, prompt	\$6.75 to \$7.00
By-product, Chicago	\$12.25
By-product, New England	\$13.75
By-product, Newark	\$12.40 to \$12.95
By-product, Philadelphia	\$12.38
By-product, Cleveland	\$12.30
By-product, Cincinnati	\$11.75
By-product, Birmingham	\$8.50†
By-product, St. Louis	\$12.02
By-product, Buffalo	\$12.50

*Maximum by-product coke prices established by OPA became effective Oct. 1, 1941. A complete schedule of the ceiling prices was published in THE IRON AGE, Sept. 25, 1941, p. 94B. Maximum beehive furnace coke prices established by OPA, Jan. 26, †F.O.B. oven. Ceiling for operators of hand drawn ovens using trucked coal is \$6.50.

FLUORSPAR

	Per Net Ton
Domestic washed gravel, 85-5 f.o.b. Kentucky and Illinois mines, all rail	\$25.00
Domestic, f.o.b. Ohio River landing barges	25.00
No. 2 lump, 85-5 f.o.b. Kentucky and Illinois mines	25.00

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick

	Per 1000
Super-duty brick, St. Louis	\$64.60
First quality, Penna., Md., Ky., Mo. & Ill.	51.30
First quality, New Jersey	56.00
Second quality, Penna., Md., Ky., Mo. & Ill.	46.55
Second quality, New Jersey	51.00
No. 1, Ohio	43.00
Ground fire clay, net ton	7.60

Silica Brick

Pennsylvania & Birmingham	\$51.30
Chicago District	58.96
Silica cement, net ton (Eastern)	9.00

Chrome Brick

	Per Net Ton
Standard or chemically bonded, Balt., Plymouth Meeting and Chester	\$54.00

Magnesite Brick

Standard, Balt. and Chester	\$76.00
Chemically bonded, Baltimore	65.00

Grain Magnesite

Domestic, f.o.b. Balt. and Chester in sacks (carloads)	\$44.00
Domestic, f.o.b. Chewelah, Wash. (in bulk)	22.00